2.0 PROJECT DESCRIPTION

This Section describes the Duke Energy proposal to modernize the Morro Bay Power Plant (MBPP) (the "Project"). The Applicant for this Application for Certification (AFC) is Duke Energy[(1)], the current owner of MBPP. Duke Energy proposes construction of two new combined cycle generating units in a single construction phase with start up and commercial operation of the units separated by approximately one month. The Project will also include demolition of the onsite fuel oil tank farm, demolition of the existing power building, removal of three 450-foot-tall exhaust stacks for Units 1 through 4, refurbishment of the sea water intake structure, and installation of a bridge across Morro Creek for construction and major maintenance. The bridge and connecting roadway will become a bicycle/pedestrian path upon completion of construction of the Project. The overall power plant modernization provides a long-range plan that represents the best solutions for both the City of Morro Bay and Duke Energy.

The new units will replace the currently operating generation Units 1 and 2 (326 megawatts [MW]), 1950's technology and Units 3 and 4 (676 MW), 1960's technology with two state-of-the-art 600 MW combined cycle units. Each new unit will be capable of producing 600 MW so that, upon completion of both of the combined cycle units, the Plant will be capable of producing a total of 1,200 MW (see Table 2-1). Each new unit will consist of two gas-fired turbines and one steam turbine driven by the heat produced by the other two turbines. Each new unit will have two, 145-foot-tall stacks. Each new unit will be substantially more efficient and, overall, will produce substantially less environmental impacts than the current Plant. The new units will also use less natural gas and less cooling water and will generate more electrical power.

Just as laptop computers can process and store more data than computers that filled entire rooms 20 years ago, power generation technology has dramatically improved in the last 40 years. These gains in efficiency allow the Project to produce similar power levels with less natural gas and cooling water.

Table 2-1 is a comparison of "gross" versus "net" generation for the existing generating units compared to that of the combined cycle units proposed by the Project. "Gross" generation is that amount of electrical power generated by the units; "net" generation is the "gross" generation less the "station service" electrical power needed to power the auxiliary equipment and systems to

(1) Duke Energy North America, LLC, a Delaware Limited Liability Company, is referred to throughout this document as "Duke Energy."

operate the units. This "station service" includes such loads as the cooling water pumps, lubricating oil pumps, feedwater pumps, lighting transformers, control systems, etc., that are necessary for plant operation. The remaining power, or "net" generation, is that generation which is stepped up to match transmission system voltage and delivered to the Pacific Gas and Electric Company (PG&E) Morro Bay Switchyard to meet market demand.

TABLE 2-1

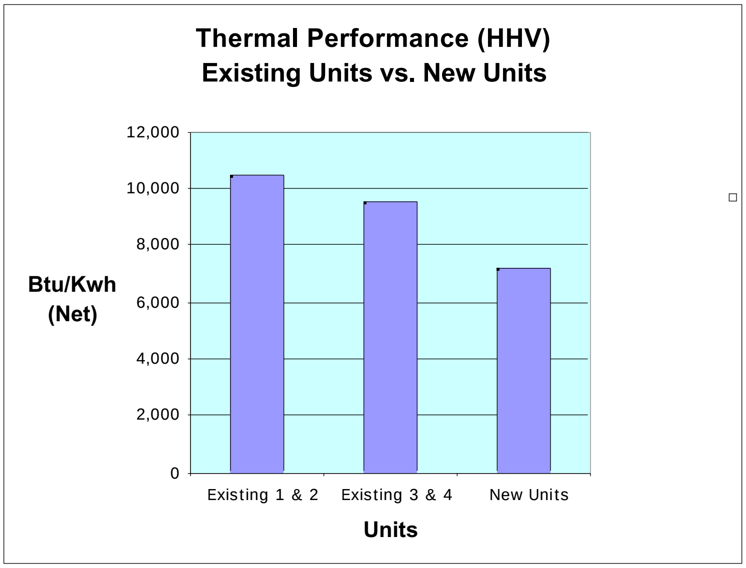
COMPARISON - GROSS VS. NET MW

EXISTING GENERATION	GROSS MW	NET MW	PROJECT GENERATION	GROSS MW	NET MW
UNIT 1	170	163			
UNIT 2	170	163			
TOTAL	340	326	1st Combined Cycle Unit	618	600
UNIT 3	345	338			
UNIT 4	345	338			
TOTAL	690	676	2nd Combined Cycle Unit	618	600
PLANT TOTAL	**1030**	**1002**		**1236**	**1200**

Figure 2-1 is a comparison of the thermal performance (heat rate) of the existing units operating at full capacity with the design thermal performance of the combined cycle units operating at maximum output with duct firing. The "Y" axis is scaled in British Thermal Units (BTUs) per Kilowatt-hour (Kwh). Btu/Kwh is a measure of the amount thermal energy in the natural gas needed to generate a Kwh of electricity. As seen in Figure 2-1, the new combined cycle units will use about 30 percent less fuel for each kilowatt of electricity generated than the 1950's technology.

The Project will be placed within the boundaries of the existing MBPP, located in the City of Morro Bay, 12 miles northwest of the City of San Luis Obispo (see Figure 2-2). Within the City of Morro Bay, the MBPP sits on the western side of town between Highway 1 and the Morro Bay shoreline (see Figure 2-3 and Figure 2-4).

Figure 2-1 Comparison of Heat Rates



Most of the typical impacts associated with development of a new power plant site are avoided by modernizing the existing MBPP. In the case of a new, stand-alone power plant, environmental impacts typically result from the construction of various elements of new electrical generating facilities including transmission lines, gas pipelines, cooling water systems, and roads. These impacts may include disruption or permanent removal of habitat, construction of new industrial developments outside of existing industrial areas, and addition of industrial elements into non-industrial viewsheds. None of these typical "greenfield" impacts will occur from the Project.

Duke Energy is proposing the Project to replace the existing Units 1 through 4 at MBPP even though these units are still viable assets in the California energy market. Units 1 through 4 have been well cared for and could continue to generate electricity indefinitely with some capital investment in emissions control systems, replacement of some of the high pressure boiler components that are approaching end of life and continued maintenance of the turbine generators and auxiliary equipment. The necessary upgrades to Units 1 through 4 would enhance continued reliability and assure ongoing compliance with regulatory requirements, but will not achieve the very significant increase in fuel efficiency and decrease in cooling water usage that can be realized from modernization as proposed by the Project.

This chapter describes the historic development of the MBPP, the public benefits of the Project, and a description of the Project. For a detailed discussion of the engineering design and operation of the Project, please refer to Chapter 8.0 - Engineering of this AFC.

2.1 DEVELOPMENT OF THE MORRO BAY POWER PLANT

Prior to PG&E's purchase of the MBPP property in 1951, the United States Navy used this site as an amphibious training center. The MBPP first produced electricity in 1955 when Unit 2 (170 MW) began commercial operation (see Table 2-2). Unit 1 (also 170 MW) was completed by PG&E in 1956 and began commercial operation in the same year. PG&E expanded the generation capacity of the MBPP with the construction of Units 3 and 4 (345 MW each) which produced electricity in 1962 and 1963, respectively. These units brought the plant's production capacity to 1030 MW (1,002 MW net). In July of 1998, Duke Energy purchased the MBPP from PG&E as part of the transition of the California electricity market to a competitive environment.

TABLE 2-2
DEVELOPMENT OF MBPP

YEAR	ACTION/ACTIVITY
1951	PG&E Purchased MBPP
1955	Unit 2 Began Commercial Operation
1956	Unit 1 Began Commercial Operation
1962	Unit 3 Began Commercial Operation
1963	Unit 4 Began Commercial Operation
1992/1996	Major Upgrades to Nos. 3 & 4 Unit's NOx Reduction, Boiler Controls and Turbine Controls
1995	MBPP Discontinued Use of Oil as Back Up Fuel
1998	Duke Energy Purchased the MBPP
2000	Duke Energy Files AFC
2001	Demolish Onsite Tank Farm
2003	Project Combined Cycle Units Expected to Begin Commercial Operation
2003	Retire Existing Units 1 through 4
2004	Demolish Three Existing 450 feet high Stacks
2004	Reconstruct Intake Building Façade
2007	Existing Units 1 through 4 and Building Dismantled and Demolished

98-710RAFC-49 REV. 10/16/00

0 15 30 MILES

SCALE

REFERENCE: USGS NATIONAL ATLAS SOUTHERN CALIFORNIA MAP, 1973.

REGIONAL MAP

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-2

98-710RAFC-118 REV. 10/16/00

REFERENCE: USGS 1:100,000 SCALE TOPOGRAPHIC MAP OF SAN LUIS OBISPO, CALIFORNIA DATED 1981.

VICINITY MAP

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-3

98-710RAFC-66 REV.10/16/00

0 2,000 4,000 FEET

SCALE

SCALE: 1: 24,000

REFERENCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP OF MORRO BAY NORTH AND MORRO BAY SOUTH, CALIFORNIA, DATED 1993 AND 1994.

SITE LOCATION MAP

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-4

The MBPP is an existing 107-acre industrial complex consisting of five fuel oil storage tanks and one displacement oil tank, three 450-foot-tall exhaust stacks, a large steam boiler and turbine generator building, and ancillary buildings and equipment. The 107-acre site also includes Leila Keiser Park, Morro Dunes RV Park and RV storage, a Fisherman's Gear Storage and boat storage facility (see Figure 2-5). Although this facility has operated since 1955, the MBPP employees have taken meticulous care of the facility, and the oldest units (Units 1 and 2) and associated equipment are in good condition and continue to produce power. The seawater intake structure located across the Embarcadero from MBPP in Morro Bay Harbor, houses eight cooling water pumps (two pumps per unit) and related auxiliary equipment. The pumps supply cooling water for all four units. The cooling water is returned to the ocean via three separate underground tunnels. Units 1 and 2 share a common cooling water discharge tunnel; Units 3 and 4 each have separate discharge tunnels. The discharge for the four units flows into a common canal for a short distance prior to entering Estero Bay, north of Morro Rock. The four units use natural gas to produce electricity, which is delivered to the California electricity market through PG&E's transmission and distribution system. The PG&E Pipeline 306, that supplies natural gas to MBPP, is 20 inches in diameter.

Duke Energy proposes to modernize and increase generating capacity at MBPP from 1,002 MW to 1,200 MW, a site increase of 198 MW net.

Upon completion of the construction phase, due to the combined cycle unit's higher efficiency and lower environmental impacts, Duke Energy expects to use both of the new units for intermediate load operations. The duct-fired design enables approximately 84 MW of additional peak capacity at average ambient temperature, per combined cycle unit (for a total of 1,200 MW net maximum output from the units) when required by the electrical system or market conditions. Just prior to completion of the construction phase of the modernization Project, Duke Energy will shut down existing Units 1 through 4 to tie in existing infrastructure and in preparation for the demolition phase of the Project.

The new combined cycle units will use the existing seawater channels to provide cooling water for the steam turbine condensers. As the combined cycle units' construction nears completion, new cooling water pumps will be installed in the pump house structure and connections made inside the plant property to reroute the seawater to the new units. The existing Units 1 through 4 will then be effectively decommissioned. Upon completion of the new generation units, Duke Energy will rebuild the façade of the existing pump house and prepare for the demolition phase of the Project.

The three 450-foot-tall stacks and the boiler-steam turbine complex for Units 1 through 4 will be demolished and recycled to the extent feasible.

In August 1999, Duke Energy initially filed an AFC to construct one 530 MW combined cycle unit at the MBPP. During the Data Adequacy phase of the California Energy Commission (Commission) process, Duke Energy became aware that the City of Morro Bay had a strong interest regarding the long-term future of the MBPP site. Duke Energy voluntarily withdrew the initial AFC in October 1999 and continued discussions with City Staff about the Project. These discussions, over a four months period, led to development and adoption of a Memorandum of Understanding (MOU) between the City of Morro Bay and Duke Energy. (For a complete discussion of Duke Energy's efforts to create a coordinated approach to the Project with the City of Morro Bay, see Chapter 1.0 - Executive Summary and Chapter 3.0 - Community Outreach.)

Goals of the MOU, which will be addressed through the technical and design aspects of the Project:

- ***Demolish the Existing Plant and Replace with a State of the Art Facility:*** Demolish the Existing Plant and Replace with a State of the Art Facility: To remove the existing power plant entirely no later than December 31, 2007 at the sole cost and expense of Duke Energy and to assure that any facility which replaces it is (i) physically smaller, (ii) located farther from the City's waterfront, and (iii) uses state of the art technology.
- ***Demolish the Existing Plant and Replace with a State of the Art Facility:*** Demolish the Existing Plant and Replace with a State of the Art Facility: To remove the existing power plant entirely no later than December 31, 2007 at the sole cost and expense of Duke Energy and to assure that any facility which replaces it is (i) physically smaller, (ii) located farther from the City's waterfront, and (iii) uses state of the art technology.
- ***Demolish Existing Oil Tanks:*** To remove the existing oil tanks located on the site of the Plant at the sole cost and expense of Duke Energy.
- ***Protect the Environmental Resources:*** To ensure that any potentially significant adverse environmental impacts are fully addressed and mitigated as required by the California Environmental Quality Act (CEQA).
- ***Protect Marine Resources:*** To ensure that any potentially significant adverse environmental impacts on marine resources are fully addressed and mitigated as required by the Commission, the Regional Water Quality Control Board, and other applicable regulatory agencies such that as mitigated, the modernization will not have significant adverse impact on marine biological resources.
- ***Protect Public Health and Safety:*** To ensure that the modernization plan complies with all Commission and San Luis Obispo County Air Pollution Control District (APCD) requirements to ensure it does not pose any significant risks to public health and safety generally and, specifically, that it does not pose any significant risk to the citizens of Morro Bay resulting from actual air emissions within the City (regardless of any APCD

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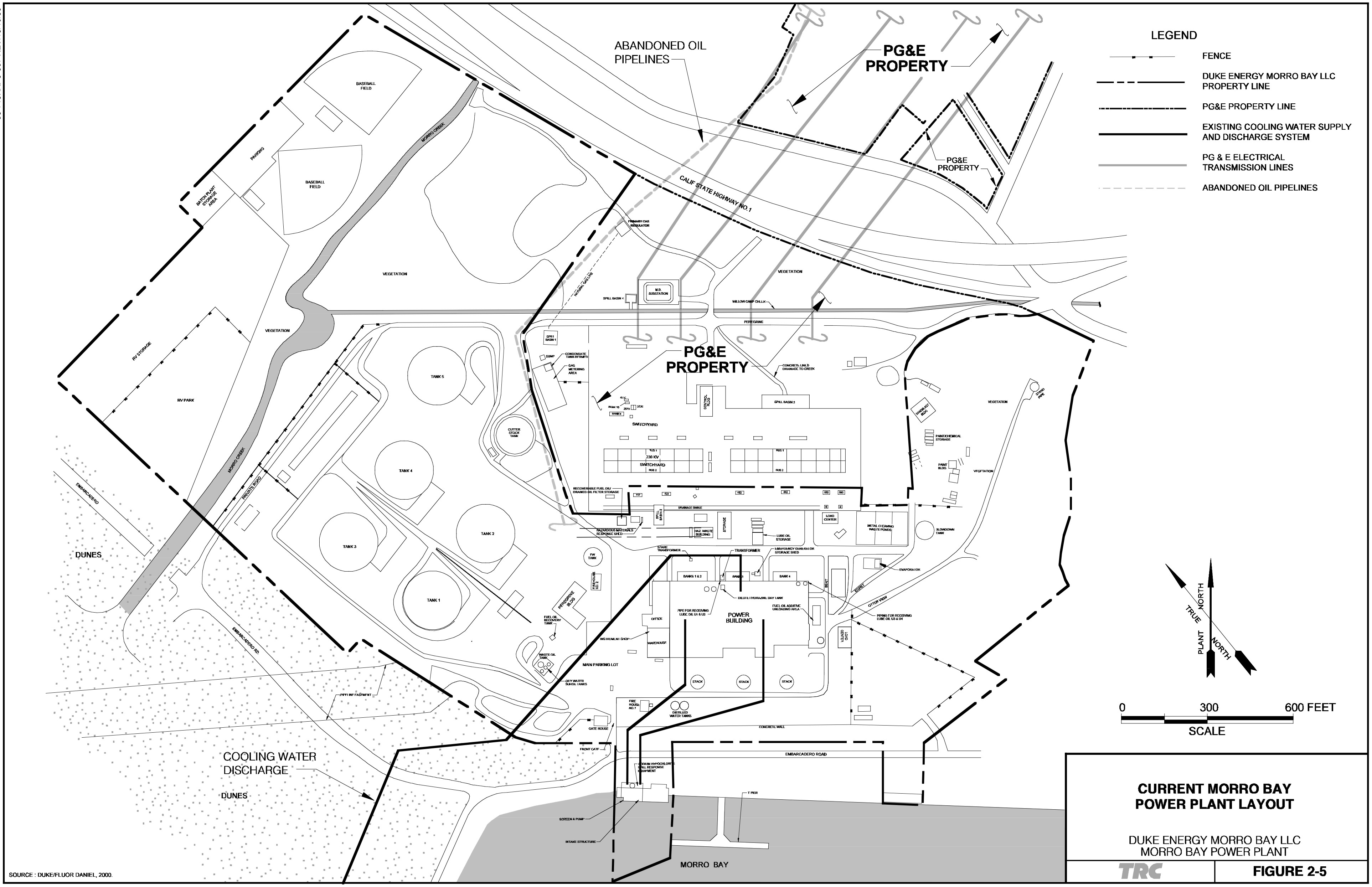


CURRENT MORRO BAY POWER PLANT LAYOUT

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-5

required emission offsets) also, to recognize that with implementation of APCD requirements for the modernization project, the Project is expected to result in an overall improvement in air quality over existing conditions.

2.1.1 DETERMINATION OF REAL BENEFITS

When Duke Energy evaluated the MBPP site, it considered the present resource availability of the MBPP and its potential for modernization. It also evaluated these systems in terms of their ability to accommodate modernization; existing location and capacity of the transmission lines; local power requirements and load growth on the central coast; location and capacity of the existing gas distribution pipelines; existing cooling water supply and outfall; and emission controls. This analysis revealed benefits to both the public and Duke Energy from MBPP modernization.

The proposed replacement of 1950s and 1960s technology with current technology results in the following benefits:

Environmental Benefits:

- Reduced overall ambient sound levels.
- More efficient and decreased use of seawater resources for condenser cooling.
- Reduced air emissions with increased generation efficiency.
- No new usage of California's freshwater resources.
- Enhanced Cultural Resources protection.
- Optimal use of an existing industrial site instead of creating a new industrial site with new interconnecting electric transmission lines and natural gas pipelines.
- Enhanced coastal views upon demolition of the existing turbine/boiler building and three 450-foot tall stacks and buffering of the new generation facilities from neighboring areas.

Socioeconomic Benefits:

- Reduced electricity costs for California consumers.
- Long term revenue guarantee of $2.0 million per year to the City of Morro Bay, which includes property taxes, gas franchise fees, Outfall Agreement lease fees and an additional enhancement payment, if needed to assure the $2,000,000 per year payment. As a result of the Project, the total property taxes paid by Duke Energy Morro Bay LLC in San Luis Obispo County will be approximately $5.5 million per year.
- Improved local electric reliability and reduced transmission losses.

- Improved bicycle and pedestrian access to the coast and recreational opportunities.
- Key Embarcadero frontage available to be transitioned for non-power plant uses.

The modernization of MBPP provides Morro Bay with a state-of-the-art corporate neighbor. Instead of operating as is, the Project allows for the replacement of the less efficient boiler/turbine generator Units 1 through 4 with market competitive combined cycle units. Installation of these new units will finance demolition of the onsite and off site tank farms; the demolition of existing Units 1 through 4, including the stacks, equipment and boiler/steam turbine-generator building; and increased funding of Morro Bay and San Luis Obispo County through higher tax payments. Based on its new assets, Duke Energy will pay an additional $4.4 million per year in property taxes to San Luis Obispo County raising its total property tax responsibility to approximately $5.5 million per year. These property taxes will support the following services in San Luis Obispo County on an annual basis:

- City of Morro Bay: $655,000
- San Luis Obispo County General Fund: $1,267,000
- San Luis Obispo County Schools and Colleges: $3,387,000
- Air and Flood Districts, Water Service, City and County Library, and Morro Bay-Cayucos Cemetery: $177,000

These property tax benefits are made even more significant since the modernized power plant does not add to the typical infrastructure demands associated with other projects (e.g., need for roads, sewers and new schools, as well as other county and city services).

In addition, the increased efficiency will reduce electricity and distribution costs for Californians, and reduce the use of cooling water and lower the amount of emissions. Finally, the Project will reduce sound levels below that which would be produced by continued operation of the existing Units 1 through 4. None of these results and the additional benefits described below will be achieved without the Project.

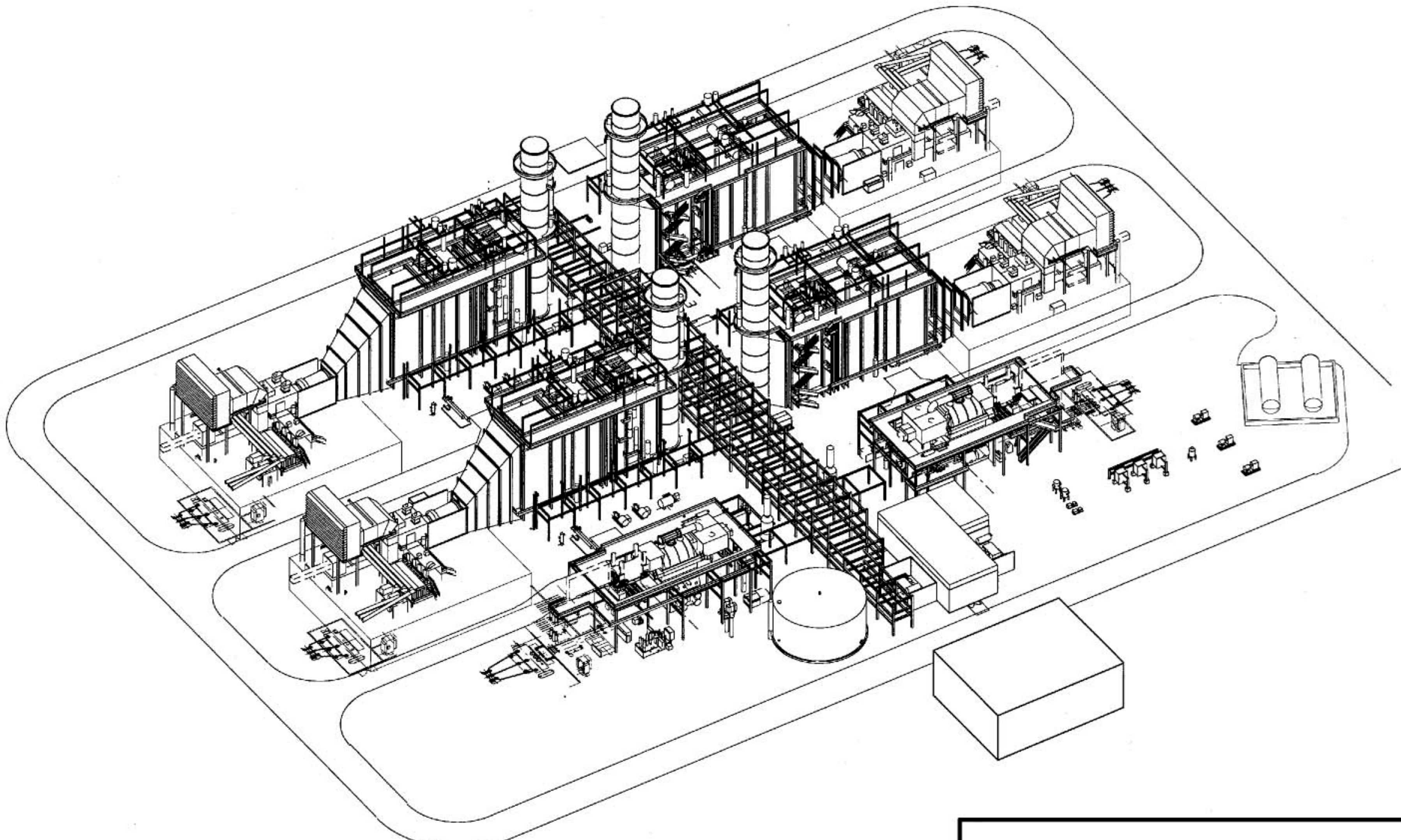
2.1.1.1 Enhancing the Coastal View

The current view of MBPP includes three 450-foot-tall stacks, five onsite fuel oil storage tanks and one displacement oil tank, a boiler/steam turbine-generator building and various other ancillary buildings and equipment (see Figure 2-5). Adjacent to MBPP is the 24-acre existing PG&E Morro Bay switchyard. This switchyard contains 230-kilovolt (kV) and 115-kV systems, including bus bars, switches, transformers, and transmission lines. The new combined cycle units will be able to reuse the PG&E switchyard with only minor modifications to the equipment in the yard. The existing power building is approximately 150 feet tall, 300 feet wide, and 500 feet long. It houses boilers and steam turbines for the four existing units. The power building's lower section, housing the turbines, is approximately 85 feet tall and the upper section housing the boilers is approximately 150 feet tall. Because this equipment is contained within a building and therefore inaccessible to an exterior crane, the building must be more than twice as tall as the installed equipment to accommodate an interior bridge crane. This design requires a taller and larger building than that proposed for the Project where exterior cranes can be deployed.

In response to comments from the community to reduce the height of structures built as a part of the Project, Duke Energy has designed and positioned the Project on the MBPP site to minimize the profile and views of the structures and wherever possible improve views of Morro Rock. (See Figure 2-6, isometric visual simulation of the Project, and Section 6.13 - Visual Resources, for numerous visual simulations of the Project from various points in the community.) The Project will use low profile buildings that permit temporary exterior crane access to the equipment for operations and maintenance. The design also conceals various equipment and piping from views, and provides for a considerably smaller building and stacks. Each combined cycle unit constructed by the Project will add two combustion turbine generators; two associated duct fired heat recovery steam generators (HRSG), approximately 95 feet high, with a steam turbine generator; two 145-foot-tall by 19 feet-diameter stacks; and other smaller equipment.

As shown in Figure 2-7, the profile of a combined cycle unit is considerably smaller than the profile of Units 1 through 4. With regard to the Project siting and design, Duke Energy is responding to extensive dialog and is cooperating with the community, to minimize visual impact. The Project is located in the area currently occupied by onsite fuel oil storage tanks. Due to the hills rising behind MBPP, portions of the community, that were built after construction of the existing plant, have views of the ocean and Morro Rock to the west. This site location minimizes the visibility of the Project's stacks and buildings from neighborhoods behind and above MBPP. Shops and restaurants located on the Embarcadero will have obscured views of the Project by orienting the new units with the stacks clustered in the center of the Project's footprint, and by siting the new units as far back from the coast as possible.

In addition, when considering the specific site plan for the new units, Duke Energy has positioned the combined-cycle units such that the orientation of the new stacks is compatible with the Morro Bay coastline. This is important because the coastline makes a natural change in direction at



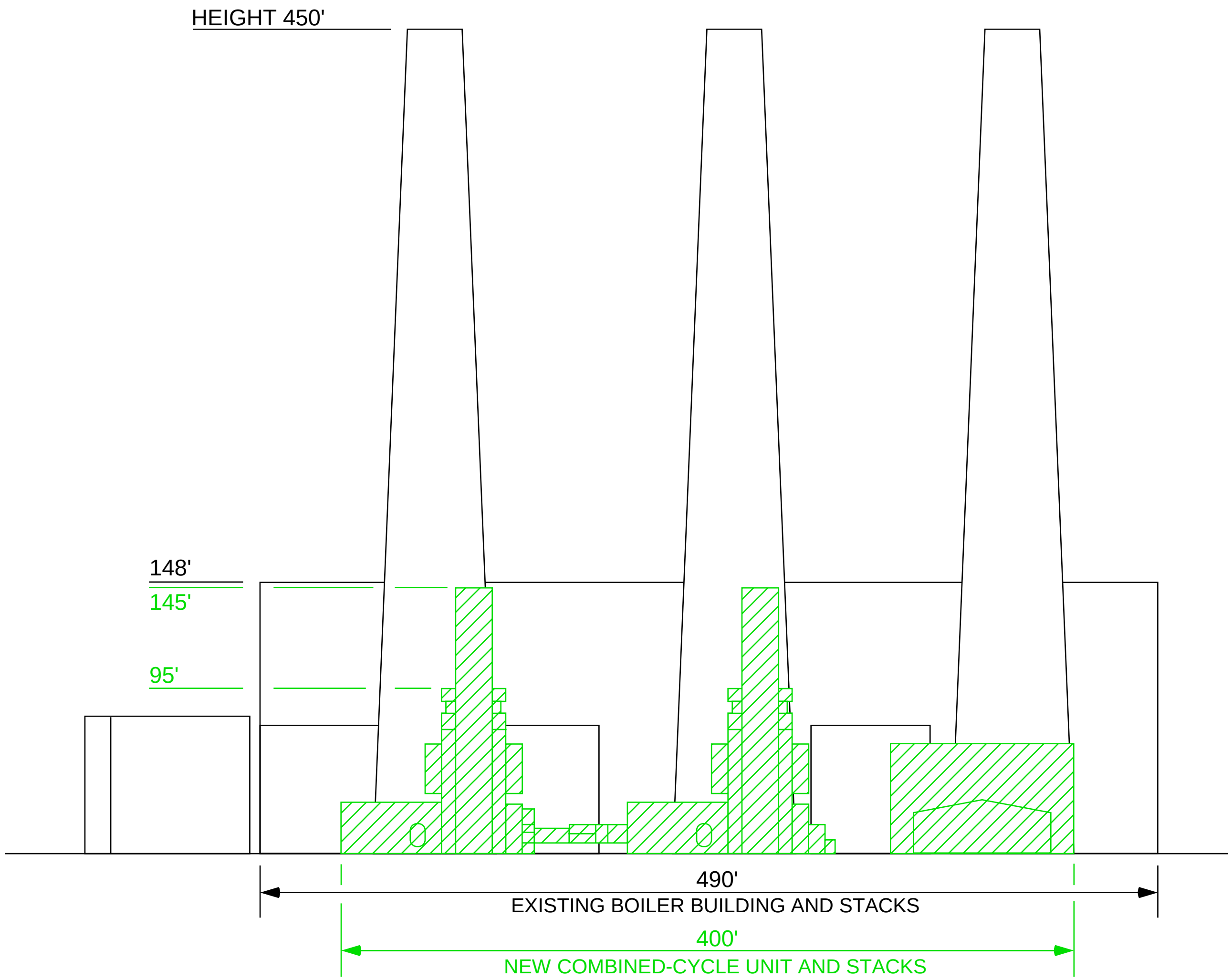
SOURCE: DUKE ENERGY AND DUKE/FLUOR DANIEL, 2000.

ISOMETRIC
1,200 MW COMBINED-CYCLE PLANT

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-6



NOTE: FOR THE PURPOSE OF COMPARISON, THE OUTLINE OF A COMBINED-CYCLE UNIT HAS BEEN SUPERIMPOSED ONTO THE OUTLINE OF THE EXISTING BOILER BUILDING

0 100 200 FEET
SCALE

COMPARISON OF BUILDING SIZE

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-7

Morro Rock, adjacent to the site. The existing MBPP stacks are roughly parallel to the coastline within the City of Morro Bay. In reviewing the original Morro Bay AFC with City of Morro Bay staff and the public, Duke Energy recognized that the Project creates an opportunity to work with the community to really develop the existing 107-acre site. The Project, as proposed in this AFC, will meet Duke Energy's needs as well as the needs of the community. During the months of Project review with the City of Morro Bay, while soliciting input for the Project, Duke Energy agreed to a single-phase construction project. By agreeing to a single-phase construction project the community will realize the benefits of development many years sooner than would otherwise have been possible. The expedited schedule proposed by the single-phase construction will lessen any disruption to the community and result in early realization of the many benefits of the Project.

In further response to City of Morro Bay and community concerns, the Project will improve the existing view of Morro Rock by removing existing Units 1 through 4, including the three 450-feet-tall stacks, equipment and turbine/boiler building. The existing stacks stand 450-foot high, 42 feet in diameter at the base tapering to 17.5 feet in diameter at the top. The removal of these stacks, along with the Units 1 through 4 power building will improve the view from many locations in the Morro Bay community. Assuming City of Morro Bay support for the Project, Duke Energy proposes to refurbish the exterior facade of the existing water intake building on the waterfront, one year after commercial operation of the combined cycle units, to make it more architecturally compatible with the objectives of the City of Morro Bay's waterfront.

The Project will also suggest paint colors and treatment colors for stacks and buildings that will enable the Project to blend into the background as much as possible and reduce the Project's visual impact.

Finally, the Project will include landscaping to reduce its visibility from near views. From distant views the landscaping will improve the overall appearance of the facility. Considerable consultation between Duke Energy's and the City of Morro Bay's expert visual consultants has led to a conceptual landscape plan which will use vegetation that is indigenous to the site specific areas and micro climates to assure protection of environmentally sensitive habitat. The berms surrounding the existing onsite fuel oil tank farm will be engineered to not only provide flood protection, but also to blend with the landscaping proposed for the dune habitat on the western side of the site. The berms will also afford some visual screening from near views of the site.

Therefore, the combination of: newer technology resulting in a smaller facility, locating the facility away from the shoreline, reducing stack height, removing Units 1 through 4 and their stacks, suggesting appropriate colors for the facility, improving berm configuration and extensive landscaping will minimize the visual impacts of the Project and drastically improve almost all of the views in Morro Bay.

2.1.1.2 Reducing Electric Costs for California Consumers

The existing electric generation system in California is aging. Just as many Californians have upgraded from wall phones to desk phones to cordless phones to cellular phones, inefficient electrical generation in California can now be viably updated or replaced. Research and development has produced vast improvements in electrical generation technology, with lower production costs and reduced environmental impacts than much of the thermal generating capacity currently serving California's electric customers.

As a result of the deregulation of the California electricity market, most of the electricity bought and sold in California is through the California Power Exchange (PX). Suppliers of electric energy bid into the PX based on their availability and price of power.

Distribution companies bid in a forecast demand, which specifies the amount of electric energy that will be needed to supply their customers. From these two bid sets, and distance related transmission line losses, the PX matches supply and demand, choosing the lowest cost supply first, until the amount of electricity supplied equals the forecast demand. The price at which "supply equals demand" is the market clearing price. The market clearing price for electricity sold each hour for the next day is equal to the highest-cost generator needed to serve the last increment of forecast electric demand. The highest-cost generators tend to be older, inefficient technology. By bidding more efficient, lower-cost generation into the PX market, the Project can displace the most expensive generation otherwise required; this will reduce the market clearing price and the cost of electricity for all electricity purchased during that hour, not just the amount produced at MBPP. Therefore, by displacing the most expensive generation sources, the Project will reduce the cost of electricity to all California consumers.

Moreover, because the Project is a "merchant plant," public funds are not at risk. Licensing, construction and operation of the Project will be paid for by Duke Energy. If the Project is not profitable, California ratepayers will not be required to monetarily support the Project. Therefore, the financial risk for the success of this Project is borne entirely by Duke Energy, the Project owner.

Presently, statewide, proposed new generation is expected to serve intermediate and peaking loads. However, there are no development proposals in California to construct large units (500 MW+) to primarily serve peaking load needs. Therefore, to fill this expected peaking load need, HRSG duct firing is incorporated in the design of the new units.

During the summer when the electric loads are at their peak demand, the efficiency of most, if not all gas-fired power plants in the state is decreased. This decline is in direct correlation to the rise in ambient temperature and cooling technology used at inland generation locations. Coastal plants with lower air temperatures and highly efficient seawater cooling experience the smallest loss of efficiency during this critical time.

The new combined cycle units proposed for MBPP can generate additional power (approximately 84 MW per unit) to provide peak load support without the need to construct additional power plants. Thus, the combination of the combined cycle unit's efficiency and the duct fired peaking capacity at the modernized MBPP will add a critical asset to meet the electricity consumption needs of California in an efficient and resource sensitive manner.

2.1.1.3 Enhancing the City of Morro Bay and San Luis Obispo County Economic Bases

New construction and renovation of MBPP will increase state, county and city tax revenue from MBPP. Purchase of related equipment and supplies for the Project within the City of Morro Bay will provide additional sales tax revenues to the City of Morro Bay and San Luis Obispo County. Additional economic benefit will be derived from the general spending provided from construction payrolls, purchasing and related spending. Duke Energy estimates that the additional property taxes paid by MBPP will be approximately $4.4 million per year. Under recent State Board of Equalization decisions, property taxes from MBPP will be collected and distributed by San Luis Obispo County. It is expected that the City of Morro Bay will receive over $524,000 per year of additional property taxes paid by Duke Energy through the San Luis Obispo County Tax Collectors office. Additionally, Duke Energy expects to purchase major equipment and materials within Morro Bay and San Luis Obispo County, which will generate approximately $19.0 million in sales taxes with approximately $1,800,000 directly to the City of Morro Bay. Furthermore, franchise fees paid to the City of Morro Bay by PG&E from natural gas transportation to MBPP will be approximately $855,000 per year.

The construction and demolition periods, collectively, is expected to last 72 months, will employ an average of 128 people per month. In addition to providing the highly paid construction positions, the workforce will support 384 secondary jobs in San Luis Obispo County during the construction phase, which is expected to last 21 months (see Section 6.10.2.1.3 - Socioeconomics).

2.1.1.4 Improving Local Electric Reliability and Reducing Losses

The existing MBPP generating facility site is centrally located to the greater Central Coast load area, which stretches along the coastline from Cayucos/Morro Bay/Los Osos to Santa Maria and inland from Templeton/Paso Robles/Atascadero to San Luis Obispo. By supporting local Central Coast load, MBPP will significantly reduce the electrical losses of transmitting power from inland generation or inland substations. MBPP provides power directly into the local PG&E system to support local load. Without MBPP, electricity must travel at least 90 miles from the Midway Substation near Bakersfield or the Gates Substation near Fresno to serve the Central Coast. PG&E's Diablo Canyon power plant does not serve local loads directly, but instead transmits power to the Midway Substation where it must be transmitted back to the Central Coast to serve local load. Unfortunately, the consumer ends up paying for the electrical loss from longer transmission systems. The Project will reduce electrical losses thereby, reducing costs borne by the consumer.

Furthermore, the additional generating capability at MBPP provides additional reactive power capability that will act to improve area transmission system voltage and limit the import of reactive power into the Central Coast area. In the absence of this reactive capability provided by the Project, added reactive power capability would likely be required, from other sources at considerable incremental cost.

The addition of the 1,200 MW combined cycle generation module (198 MW net increase in generation) results in more firm generation available for direct local service to the Central Coast area loads. As local area loads grow, service can be efficiently provided from the Project, without import from the 230-kV transmission system.

2.1.1.5 Using an Existing Industrial Site

By modernizing an existing power plant, the Project avoids the following impacts:

- Development of at least one separate new industrial site.
- Construction of new offsite transmission lines.
- Construction of a new interconnecting high-pressure natural gas pipeline.
- Construction of a new cooling water system (using ocean water, ground water or reclaimed wastewater).

Furthermore, the MBPP site is within an area not designated as unsuitable for power plant development by the California Coastal Commission (see Cal. Public Res. Code Section 30413[b]).

The existing facilities that support MBPP will not require upgrade or expansion. The PG&E interconnection study included as Appendix 6.18-2 shows no normal overloads on the PG&E system with the addition of the Project. Therefore, the Project will not need to modify any electric transmission lines. The natural gas distribution supply pipeline is large enough to provide the natural gas required for the Project. No new ocean intake or outfall will be constructed. Therefore, the Project will provide efficient electric generation with minimal disturbance to the natural and urban environment; thus, efficient and environmentally improved use of the site conceivably avoids the need to construct a new stand-alone, "greenfield" power plant.

2.1.1.6 Creating Access to the Coast and Improving Recreational Opportunities

The Project proposes to construct several new bicycle and pedestrian paths (see Figure 2-8). A vertical (perpendicular to the coast) Class II path will link a (horizontal or parallel to the coast) shoreline path to a recently constructed Class I bike path on the Highway 1 side of MBPP. The path parallel to the coast will be Class I along Embarcadero in front of the MBPP and will become Class II as it extends to the bridge over Morro Creek. Another vertical Class I bicycle and pedestrian path is being proposed for the south side of the MBPP property to provide perpendicular access from Main Street to Embarcadero. This system will create a bicycle/pedestrian circulation loop entirely around the MBPP property. These additional paths will expand recreational opportunities already promoted by MBPP through its lease of the Lila Keiser Park to the City of Morro Bay for $1 per year. It is also anticipated that a Project built bridge across Morro Creek will both reduce construction impacts and improve future bicycle and pedestrian access to the shore.

2.1.1.7 Reducing Overall Noise

The combined cycle units will be considerably quieter than the existing Units 1 through 4. The low-profile buildings reduce the sound to levels that will be indistinguishable from the existing background sound levels. When Units 1 through 4 are decommissioned, existing noise levels within the community will be reduced. For example, Unit 1 is the loudest currently operating unit and it produces 109 A-weighted decibels (dBA) at 3 feet from the draft fan air inlet, but the combined cycle units' major equipment will produce only 85 dBA at 3 feet when measured inside the low profile building enclosure. Additionally, Duke Energy will specify sound dampening insulation on the interior of the low profile buildings to further reduce environmental noise in the area surrounding the MBPP. An engineering specification has not yet been developed for the insulation requirements. The following are Project design features which will improve sound levels from MBPP:

- Specification for "quiet" transformers.
- Additional stack silencing.
- Heavier gauge material for the HRSG casing.
- Enclosures for equipment that produces louder sound levels, such as gas fuel compressors.
- Additional insulating material on the HRSGs.
- Noise wall constructed on the northern berm.

The sound wall will be located on top of the berm, south of Morro Creek and the Fisherman's Gear Storage facilities. Landscaping and architectural features in the design of the wall will enhance visual appeal. It will also curve briefly around on the top of the western berm to protect portions of the beach area from sound.

During Public Workshops conducted during the 120-day Pre-Application Review period with the City of Morro Bay certain members of the public expressed concern about construction noise as an issue for residents and tourists visiting the community. Duke Energy has investigated alternative pile driving methods and intends to use an auguring method for driving piles which is not only quiet, but also results in much less vibration due to impacts to secure the piles.

2.1.1.8 Minimizing Use of Freshwater

MBPP uses seawater primarily to condense steam for reuse in the steam cycle. A small amount of seawater is also used to supply feedwater to the evaporator that produces distilled water, which in turn is used for boiler water makeup. The Project will use ground water only for fire, landscaping and potable service uses. The continued use of seawater cooling allows the modernized MBPP to provide highly efficient electric power generation without using fresh water.

Freshwater supplies on the Central Coast are limited. A typical 1,200 MW power plant can evaporate approximately 11,000 to 14,000 acre-feet per year of freshwater as a result of larger, wet cooling towers that create large visible plumes. By using seawater for cooling, the Project avoids the consumption of 11,000 to 14,000 acre-feet per year of freshwater (14,000 acre-feet per year is equivalent to about 8,700 gallons per minute). The use of seawater cooling also avoids the disposal

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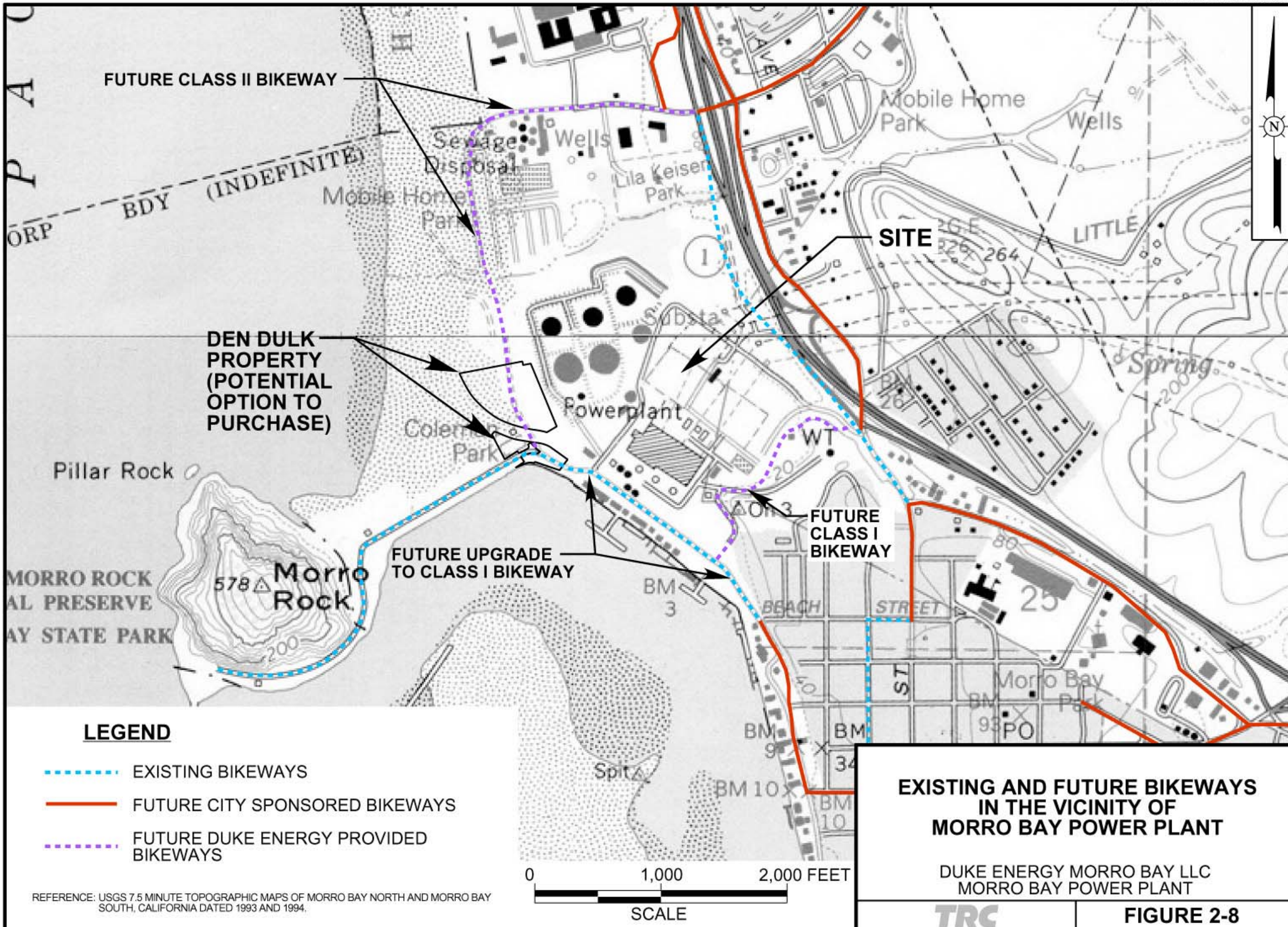

EXISTING AND FUTURE BIKEWAYS IN THE VICINITY OF MORRO BAY POWER PLANT

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-8

and the environmental effects of wastewater and solids that would be generated by the use of a closed freshwater system. These negative affects are completely avoided by the continued use of once-through seawater cooling.

MBPP typically uses 10,000 gallons of freshwater per day from its onsite wells for routine operation of the facility. Currently, during maintenance periods, more than 100,000 gallons per day may be used for such short term activities as stack washing, boiler fireside washing and boiler air preheater washing. During construction of the Project, these same short-term peak usages will occur, primarily for dust control during grading activities and while implementing initial landscaping plans. Potable water usage is not expected to increase significantly during construction since onsite showering will not be available to the construction crews and portable toilet facilities will be used on the construction site. The use of portable toilets will also assure that the Project construction will not impact the City of Morro Bay's sanitary sewer system.

Upon commercial operation of the Project, potable water usage and sanitary sewer flow to the City of Morro Bay sewer system is expected to be slightly reduced, since Project staffing requirements are slightly less than staffing requirements for the existing MBPP. Once the landscape plan has been implemented, use of drought tolerant plants will assure use of freshwater for irrigation is minimized.

2.1.1.9 Decreasing Impacts from Seawater Cooling

The Project is more thermally efficient and will require significantly less cooling water than the existing Units 1 through 4, the units that will be replaced by the Project. Units 1 and 2 currently use 184,000 gallons per minute (gpm) and Units 3 and 4 use 280,000 gpm, whereas the combined-cycle units only use a maximum of 165,000 gpm each resulting in a decreased water usage of 134,000 gpm, (a 29 percent reduction). Without duct firing of the HRSG's, each combined cycle unit seawater usage will be further reduced to 123,750 gpm each for the steam turbine condenser. Additionally, the seawater intake flow velocity from Morro Bay Harbor will decrease. The current average flow velocity for Units 1 and 2 is 0.37 feet per second (fps) and for Units 3 and 4 it is 0.51 fps (as measured in 1999). The flow velocity for the combined-cycle units will be reduced to about 0.3 fps due to their lower cooling water requirements. Decreasing intake flow velocity has the environmental benefit of reducing impingement of marine organisms. Table 2-3 below summarizes these decreased impacts.

TABLE 2-3

SUMMARY OF SEAWATER COOLING WATER USE

	Units 1 & 2	Units 3 & 4	Total Units 1-4	One Combined Cycle Unit (no duct fire – base load)	One Combined Cycle Unit (duct fired – peak load)	Two Combined Cycle Units (no duct fire – base load)	Two Combined Cycle Units (duct fired – peak load)	Total Decrease
Water Use (gpm)	84,000	280,000	464,000	123,750	165,000	247,500	330,000	134,000
Inlet Flow Velocity (fps)	0.37	0.51	N/A	0.25	0.33	0.23	0.30	N/A

2.1.1.10 Increasing Efficiency and Reducing Emissions

Once completed, the combined-cycle units will be among the most efficient generators serving the California market. By providing additional efficient generation, older, less efficient generators elsewhere will not operate as often. New technology in gas turbine materials, combustion processes and exhaust gas treatment reduces emissions with increased efficiency and output power. Thus, additional efficient generation will reduce emissions and improve air quality statewide.

In addition, the combined cycle units will use the current best available control technology (BACT) including selective catalytic reduction (SCR) for control of nitrogen oxides (NO_x) and an oxidation catalyst for control of carbon monoxide.

2.1.1.11 Enhanced Cultural Resource Protections

Duke Energy and the San Luis Obispo County Chumash Council (SLOCCC) have entered into a Memorandum of Agreement (MOA) concerning protection and preservation of cultural resources (see Appendix 6.7-5 for a copy of the MOA). The City of Morro Bay urged Duke Energy to work with the SLOCCC and established the SLOCCC as the conduit for other Native American groups. Duke Energy and its archaeological consultants confirmed that the SLOCCC and other Native Americans, such as the Salinans, have historic heritage in the Morro Bay area, but the cultural resources found at the MBPP site are prehistoric, where only the Chumash have established heritage. The MOA establishes a policy for inclusion of all interested Native Americans in the area and the MOA establishes the SLOCCC as the conduit for addressing cultural issues related to the Project.

Additionally, the MOA has resulted in specific plans for surveying and monitoring activities by a professional archaeologist and trained and qualified Native American monitors. Archaeological surface surveys, as well as geo-archaeological sub-surface surveys have been performed at the site in conjunction with topographical and geotechnical surveys.

Trained and qualified Native American monitors will be onsite during earth disturbing activities associated with the Project. Specific procedures are in place for reporting and handling the discovery of artifacts or inadvertent discovery of human remains. Construction personnel will be required to participate in Cultural Sensitivity Training prior to commencing work at the site. An onsite location will be established for archiving and cataloguing artifacts discovered during construction. A process has been established between Duke Energy and the SLOCCC for cooperative resolution of cultural issues that will minimize impact to the construction schedule, but assure preservation of cultural resources. The following is a listing of the key elements of the MOA (see Section 6.7 - Cultural Resources and Appendix 6.7-5).

- Pre-construction consultation.
- Cultural Resources Sensitivity Training for construction employees.
- Onsite Project Archaeologist.
- Onsite monitoring by SLOCCC trained and qualified monitors during ground disturbing activities.
- Procedure for Inadvertent Discovery of artifacts or human remains.
- Onsite repository for storing of artifacts during the Project.
- Process for other Native American individuals or groups to provide recommendations for the protection of cultural resources.
- Permanent protection of an existing cultural resource area as part of the long term site plan.

2.1.2 PROJECT

The Project will be sited within the existing MBPP property in the area of the onsite fuel oil storage tank farm (see Figure 2-9). The Project includes: 1) demolition of the five 150,000 barrel (bbl) capacity fuel oil storage tanks and one 35,000 bbl capacity displacement oil storage tank and re-grading and berm configuration in the onsite tank farm area; 2) the construction of two 600 MW combined cycle units; 3) the demolition and removal of the existing stacks and turbine generator buildings for Units 1 through 4; 4) the construction of a new façade for the intake structure;

5) construction of a bridge over Morro Creek which will also result in a pedestrian/bicycle path that will link with other paths to provide a circulation path completely around the Duke Energy property; and 6) numerous environmental and socioeconomic improvements to the MBPP site and the City of Morro Bay explained in detail in the various sections of Chapter 6.0 - Environmental Information. The existing tank farm will be removed as part of this Project to:

- Improve the visual character of MBPP and improve views to Morro Rock.
- Expedite environmental clean-up actions by PG&E as provided for in the purchase agreement, which requires that PG&E clean-up potential below ground environmental contamination created before July 1, 1998, on the MBPP.
- Fulfill Duke Energy's commitment to burn only natural gas at MBPP. The original units were capable of using either natural gas or fuel oil to fire the existing boilers.

The Project will provide intermediate load power for voltage support and will improve electrical service reliability for the Central Coast communities as well as the Fresno and Bakersfield communities. The Project is expected to have an availability of approximately 90 percent, capable of operating an average of 8,000 hours per year. The additional 198 net MW of capacity(2) will be produced by four natural gas fired combustion turbine generators (CTGs), four duct-fired, three-pressure-level, HRSG's and two reheat, condensing steam turbine generators (STG). In addition, the Project will include a 2,500-square-foot control room to house the MBPP distributed control system and plant operations personnel. The Project will provide electrical power to the grid through PG&E's 230 kV switchyard located adjacent to the MBPP. The Project will connect to this switchyard through a short generation tie. No offsite transmission lines or transmission line upgrades are required.

Natural gas for the facility will be delivered via PG&E's existing Pipeline 306 from the Kettleman Compressor Station, approximately 70 miles from the PG&E Primary Gas Regulating Station. The existing pipeline is adequately sized to accommodate the fuel demand of the Project. The Project will be connected to the existing regulator station via short segments of new onsite natural gas pipeline. To create the pressure required for the combustion turbines, the Project will add an onsite electric compressor station for the combined-cycle units. The Project will not affect the local natural gas supply or distribution system that are owned and operated by the Southern California Gas Company.

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(2) The Project will produce 1,200 MW net while the existing output of Units 1 and 2 is 326 MW net and the output of Units 3 and 4 is 676 MW net. Therefore, the Project will add 198 MW of capacity over the current capacity of MBPP.

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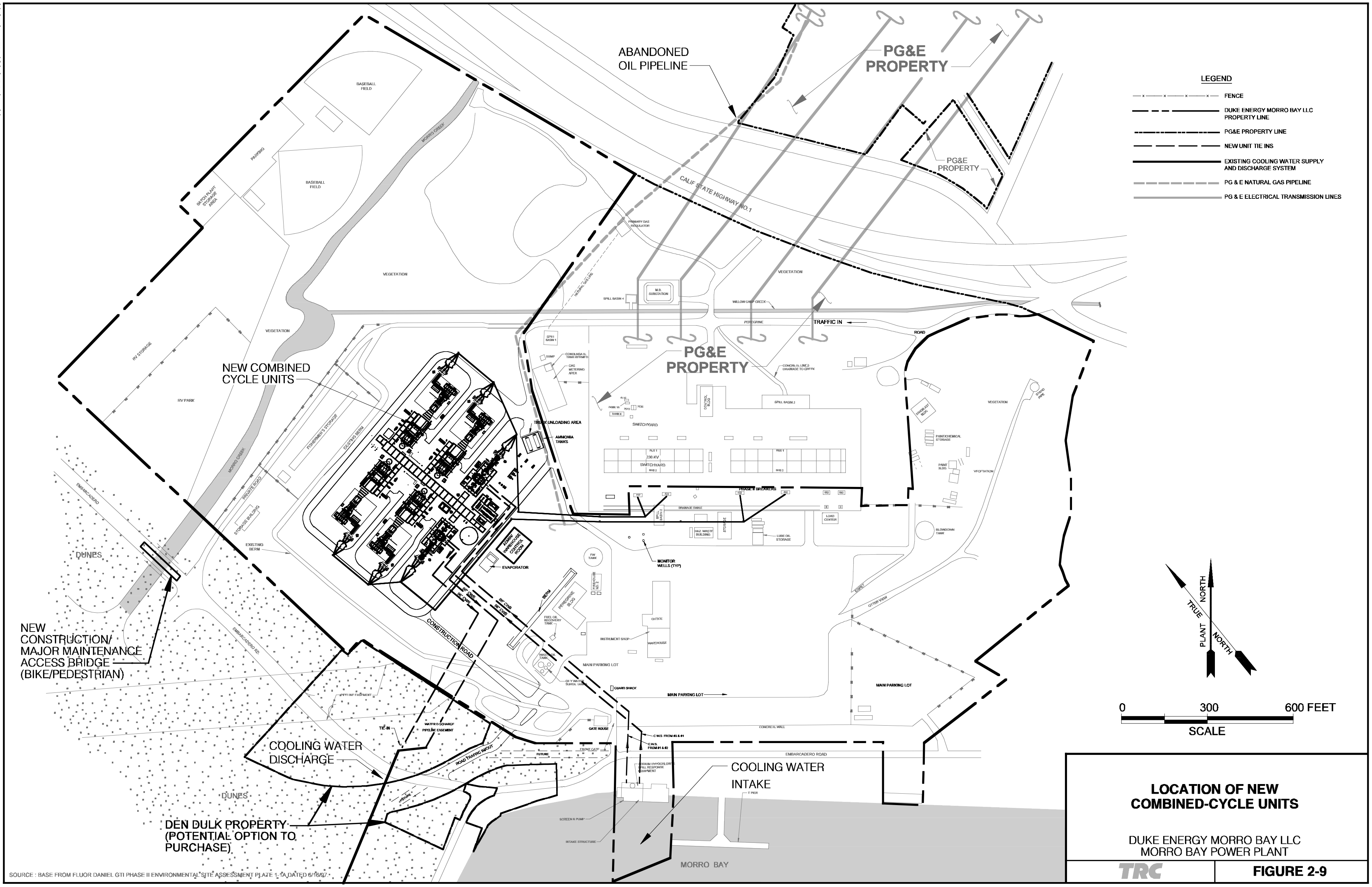

LOCATION OF NEW COMBINED-CYCLE UNITS

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FIGURE 2-9

In addition to connecting the Project to the existing PG&E switchyard and natural gas fuel supply pipeline, other existing infrastructure will be reused by the Project:

- Cooling water intake and discharge systems including buildings, structures and tunnels (except for onsite tie-in for the new units).
- A State Land's easement administered by the City of Morro Bay for the cooling water discharge tunnels to the discharge canal near Morro Rock.
- Deep well pumps and a raw water standpipe to supply fresh service water and fire system make-up for Duke Energy and PG&E facilities on the site.
- A hypo-chlorination system to supply potable water to Duke Energy and PG&E facilities at the site.
- Local highways and City of Morro Bay surface streets for access by employees and equipment.
- Telecommunications infrastructure for voice communications as well as data transfer with the Independent System Operator for reliable operation of the electric system.
- Connection to an electrical grounding grid in common with the PG&E switchyard to protect personnel and equipment from different potential voltages.
- Continued use of an existing storm water drainage system through an RWQCB approved discharge point.
- Continued use of an existing, permitted Oily Water Separator System for processing runoff from industrial areas of the site that discharges to a Central Coast Regional Water Quality Control Board (RWQCB) approved discharge point.
- Continued use of a sea water Vapor Compression Evaporator system to supply high quality make up water for the combined cycle unit systems, thus avoiding use of fresh water resources for make up water processing.

The Project will employ up to 831 onsite workers during the peak construction period, which is expected to be in month 10 of the 21 months construction phase of the Project (see Figure 2-10). During the peak construction period it is anticipated that there will be 631 workers onsite for the day shift and 200 workers onsite for the evening shift (see Figure 2-10). Construction and demolition is expected to take approximately 72 months, with commercial operation anticipated during the third quarter of 2003 (see Figure 2-11).

The construction phase of the Project is expected to take 21 months from groundbreaking, through construction, start up testing and commercial operation of the first combined cycle unit. The second unit is expected to be tested and released for commercial operation about 30 days later. During the early phase of construction, while grading and compaction are being performed, the bridge across Morro Creek will be constructed. This will assist in traffic control by having the bridge available before the majority of the construction workforce is mobilized.

The demolition phase of the Project is expected to take approximately four years. Before demolition can occur, remediation of hazardous materials such as asbestos, lead and mercury will be performed. Most of the asbestos containing material is in the high temperature piping thermal insulation, typically used in structures of this age; some of the existing plant equipment is coated with lead based paint; and mercury may be found in small quantities in electrical switches used in alarm and control circuits. Small quantities of insulating oil, containing PCB, may be found in older capacitors or transformers. As soon as possible after retirement of Units 1 through 4 and commercial operation of the new combined cycle units, the three 450-foot-tall stacks will be removed. Concrete from the stacks will be reused as fill for the power building basement. Then the remainder of the boiler and turbine generator building and equipment will be salvaged and recycled to the extent possible. Through the facility purchase agreement, once the facilities are removed, PG&E will be responsible for assuring remediation of pre-existing Solid Waste Management Units (SWMU). PG&E will assure soil and groundwater is free from contamination including consulting with all appropriate agencies to determine procedures and clean up levels and obtaining necessary permits/approvals. Duke Energy will coordinate with PG&E to assure that the SWMU's are available to PG&E as soon as the areas are exposed (see Section 6.15 - Waste Management).

The foundations will be removed and the power building basement back-filled using crushed concrete rubble from the demolition work, to the extent possible, to minimize importing of fill material. The site will then be compacted and graded to assure proper drainage and prevent erosion. See Section 2.4 for a detailed description of the demolition phase of the Project.

2.1.3 TANK FARM DEMOLITION

Duke Energy purchased the MBPP from PG&E who had operated the plant as a "dual fueled" generating facility, capable of burning either natural gas or oil fuel in the boilers, for more than 40 years. Fuel oil combustion typically occurred in the winter months when natural gas supplies were curtailed; however, fuel oil was also burned for economics (when fuel oil was cheaper than natural gas) or for inventory control. In the mid 1990s, it was determined that fuel oil, as a back up fuel, was no longer necessary for reliable operation of the facility due to improvements in the natural gas pipeline supply system. The increasing costs and potential risk of environmental release associated with maintaining the fuel oil system has made it uneconomical for MBPP. As a result, Duke Energy has determined that the existing above ground fuel oil storage tanks at MBPP are no longer needed since the plant is now fueled only by natural gas. Removal of the tanks, along with demolition of the existing power building and stacks for Units 1 through 4, will further offset visual impact of the Project.

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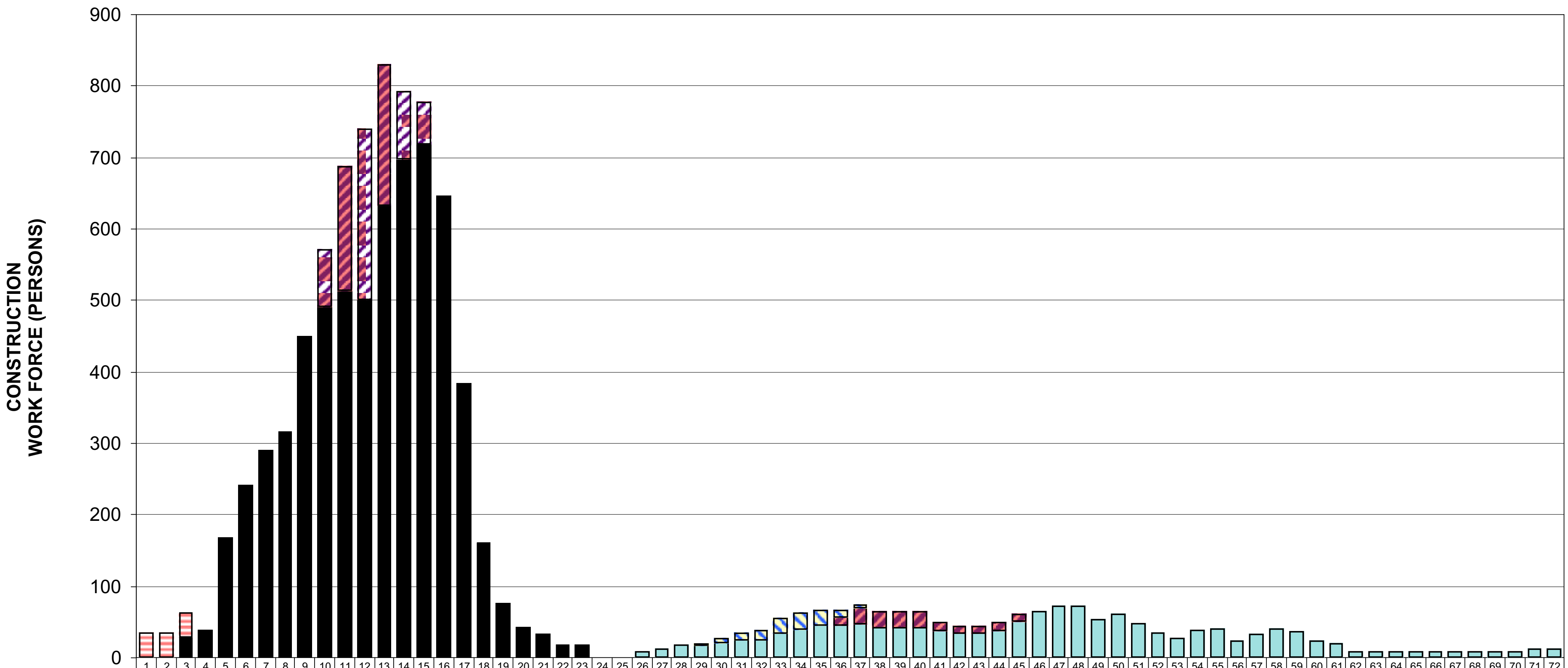

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Onsite Tank Farm Demolition	35	35	35																					
New CC Units 2nd Shift										80	175	240	200	95	60									
New CC Units 1st Shift			29	39	169	242	291	317	450	491	513	501	631	698	718	647	385	161	77	44	34	19	19	0
Pump House																								
Stack Removal Units 1-4																								
Existing Power Building Demolition																								

	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Onsite Tank Farm Demolition																								
New CC Units 2nd Shift																								
New CC Units 1st Shift	0																							
Pump House					4	8	12	16	24	24	24	12	4											
Stack Removal Units 1-4												12	24	24	24	24	12	12	12	12	12			
Existing Power Building Demolition		9	13	18	18	22	26	26	35	42	46	46	48	44	44	44	40	35	35	40	52	66	73	73

	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
Onsite Tank Farm Demolition																								
New CC Units 2nd Shift																								
New CC Units 1st Shift																								
Pump House																								
Stack Removal Units 1-4																								
Existing Power Building Demolition	55	62	48	35	29	40	42	24	33	42	37	24	20	9	9	9	9	9	9	9	9	9	13	13

LEGEND

- Onsite Tank Farm Demolition
- New CC Units 2nd Shift
- New CC Units 1st Shift
- Pump House
- Stack Removal Units 1-4
- Existing Power Building Demolition

SOURCE: DUKE ENERGY AND DUKE/FLUOR DANIEL, 2000.

WORK FORCE LOADING
PROJECT CONSTRUCTION

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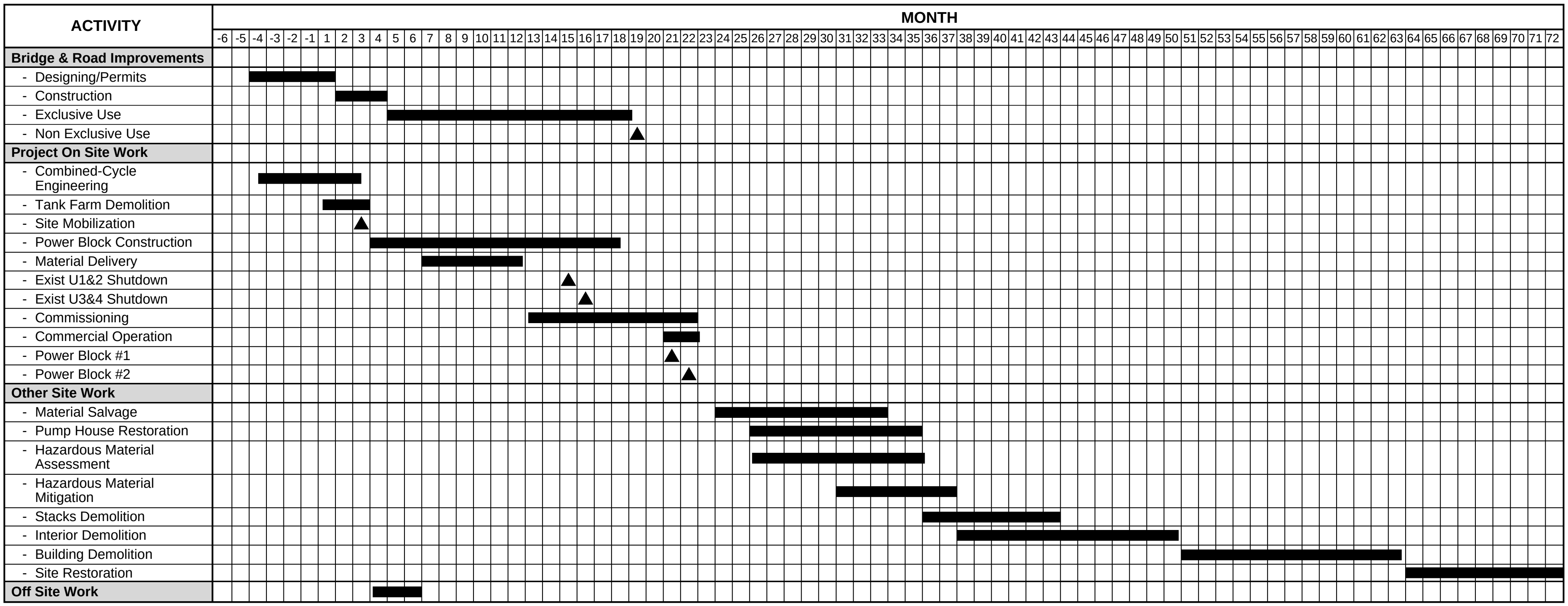
MORRO BAY POWER PLANT

TRC | **FIGURE 2-10**



SOURCE: DUKE ENERGY, 2000.

PROJECT SCHEDULE OF ACTIVITIES

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FIGURE 2-11

Prior to commencement of the fuel oil tank removal, Duke Energy will assure that any remaining oil from the tanks is removed. The tanks will be cleaned and asbestos-containing material removed in accordance with the law. Removal of the asbestos containing material used in some of the insulation will eliminate the need for on going maintenance of the insulating material on the equipment and pipelines to assure no release to the environment. The tanks will be cut using torches or shears, the material will be loaded on trucks, and metal material will be sold to a third party for recycling. Waste concrete will be ground-up and used as a roadbed/fill material during demolition of the Units 1 through 4 power building.

All work to remove Tanks 1 through 5 will occur within the exterior berms surrounding the tanks, an area of about 15 acres. Additional work will occur outside the bermed area for removal of piping and equipment for fuel oil transfer and at No. 1 Displacement Oil Tank and its equipment. The area outside the fuel oil tank berm comprises about 9 acres. For the purpose of the work, this area is considered the "site."

As part of due diligence prior to the sale of the facilities, Duke Energy and agencies confirmed that, with the exception of the area under the aboveground tanks that could not be tested, all soil in the vicinity of the tanks was free of oil contamination. A review of the Phase I and Phase II Environmental Site Assessment Reports and operating history of the site indicates that Tank Farm demolition will be a brief, non-contentious, routine activity. The scope of work is not as great as the scope or scale of other work historically performed on the site and is included in this AFC in response to the City of Morro Bay's request that it be part of this application's filing. Through the Facility Purchase Agreement, once the tanks are removed, PG&E is responsible for assuring that the soil and groundwater under each tank is free from contamination including consulting with appropriate agencies and obtaining necessary permits/approvals. Duke Energy will coordinate with PG&E to assure that the area is available to PG&E as soon as the tank's pads are exposed.

Once all facilities and oil-contaminated material are removed, Duke Energy will grade the site for construction and establish a drainage pattern that will be designed to handle stormwater runoff as well as prevent erosion of the site or cause sedimentation to flow to creeks or waterways. (Additional information regarding site grading and drainage can be found in Section 8.2.1 - Site Grading and Drainage). Tank removal is expected to occur from December, 2001 through February, 2002.

Duke Energy intends that the fuel oil tank demolition and salvage will be done by California Department of Occupational Health and Safety (OSHA) qualified workers using approved and permitted equipment. All work will be done within the confines of the MBPP area, including lay down areas, temporary storage of equipment, and contractor employee parking. It is anticipated that these activities will require, on average, one shift of 35 contractor workers for three months (see Figure 2-10).

2.2 GENERATION FACILITY DESCRIPTION, DESIGN AND OPERATION

This section provides a description of the Project location and layout; the site and site selection considerations; the design, construction and operation of the Project; and the interconnection with PG&E's transmission system. Chapter 8.0 - Engineering and Appendices 8.1 through 8.8 contain a detailed description of the engineering design, construction and operation of the Project.

2.2.1 FACILITY LOCATION AND LAYOUT

The MBPP is located within the city limits of Morro Bay, about 12 miles northwest of the City of San Luis Obispo (see Figure 2-2). Morro Bay is a diverse community focused on the advantages of its coastal location. The Project is located on the northwestern side of the approximately 107 acres of the MBPP site within the existing oil tank farm for Units 1 through 4. The legal description of the Property is as follows: a portion of the northwest quarter of Township 29 South, Range 10 East, San Bernardino Base and Meridian. Current United States Geologic Survey Maps do not delineate sections for land on which the site is located. The assessor's parcel number for the Property is 066-33-1035. The MBPP can be reached from the north or the south from Highway 1 and from the east from Highway 41.

In general, the Property is surrounded by light industrial, commercial, marine, residential and recreational land uses. The Pacific Ocean, Estero Bay, Morro Bay and Morro Rock border the Property to the west, and U.S. Highway 1 borders the Property to the northeast. An RV/Trailer Park and the Lila Keiser Park including the baseball fields (owned by Duke Energy and leased to a private individual and the City of Morro Bay respectively) are located on the north side of the Property. Just south of the Property is residential and commercial land uses.

The existing layout of MBPP is shown in Figure 2-5. The MBPP currently consists of four boilers, generators, and turbines and associated facilities. A 24-acre switchyard area (owned and operated by PG&E) is located on the north side of the Property. The power building is on the south side, and an onsite fuel oil storage tank farm is located on the western side of the Property. As shown in Figure 2-9, the Project will be located within the area of the existing onsite tank farm.

Elevation drawings for the existing facilities and the Project, and drawings showing the connections to the existing natural gas, cooling water and switchyard facilities are shown in Figures 2-12 and 2-13.

The Project will be constructed in a single phase, with each combined cycle unit consisting of two combustion turbine generator sets and a steam turbine generator, as shown in Figure 2-14. Duke Energy will also construct a 2,500-square-foot control room just south of the combustion turbine generator sets. Dimensions of a combined-cycle unit and a computer isometric of the Project are provided in Figures 2-15 and 2-6, respectively. The gas turbines and steam turbines will be enclosed in a low-profile building, with a removable roof for maintenance access, to further reduce visual aspects of the Project.

MBPP's visual appearance, prior to and following construction, is shown in Figure 2-16. A detailed visual resource analysis is provided in Section 6.13 - Visual Resources.

Access to the Project will be provided via existing and newly constructed MBPP roads. To reduce construction related traffic through downtown Morro Bay, the Project will construct a bridge over Morro Creek to allow construction access to the north. In addition, Duke Energy will construct a parking lot and an approximately 20-feet-wide loop road around the Project for ease of access.

2.2.2 SITE DESCRIPTION

The Project will occupy approximately 8 acres of MBPP property (see Figure 2-9). The MBPP site is not located within the area designated as unsuitable for power plant development by the California Coastal Commission.(3) Locating the Project onsite is consistent with the Morro Bay Local Coastal Plan for coastal dependent industrial land uses and the Morro Bay General Plan. A chain-link fence encloses the Property, with the gate manned by security personnel.

The site is located at an elevation that ranges from 15 to 23 feet above mean lower low sea level. An onsite fuel oil storage tank farm currently occupies the area planned for the Project. Duke Energy will remove these tanks as a stage of the Project included in this AFC. PG&E is responsibility for any onsite, below ground contamination that may have occurred before July 1, 1998. Any contamination found in the area will be assessed, treated, labeled or disposed of as required by applicable laws, ordinances, regulations and standards (LORS) to provide a clean site for the

(3) Cal. Publ. Res. Code Section 30413(b).

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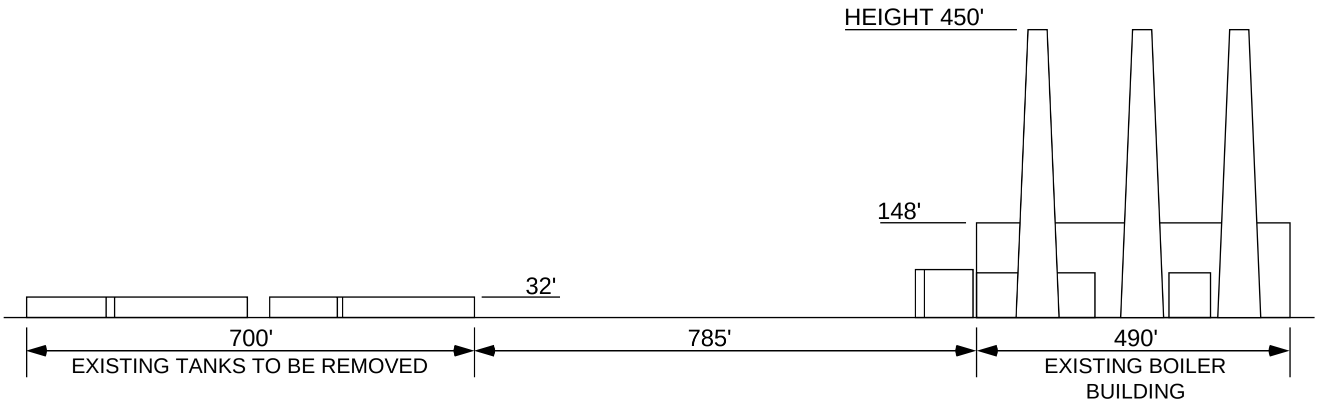
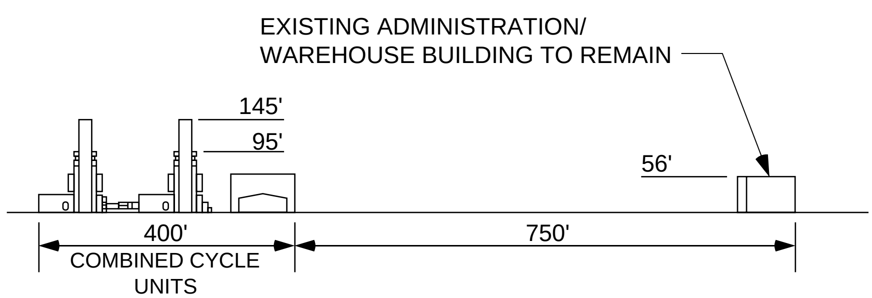


EXISTING CONDITIONS



AFTER MODERNIZATION

0 300 600 FEET

SCALE

ELEVATIONS
EXISTING PLANT AND PROJECT
VIEW LOOKING NORTHEAST

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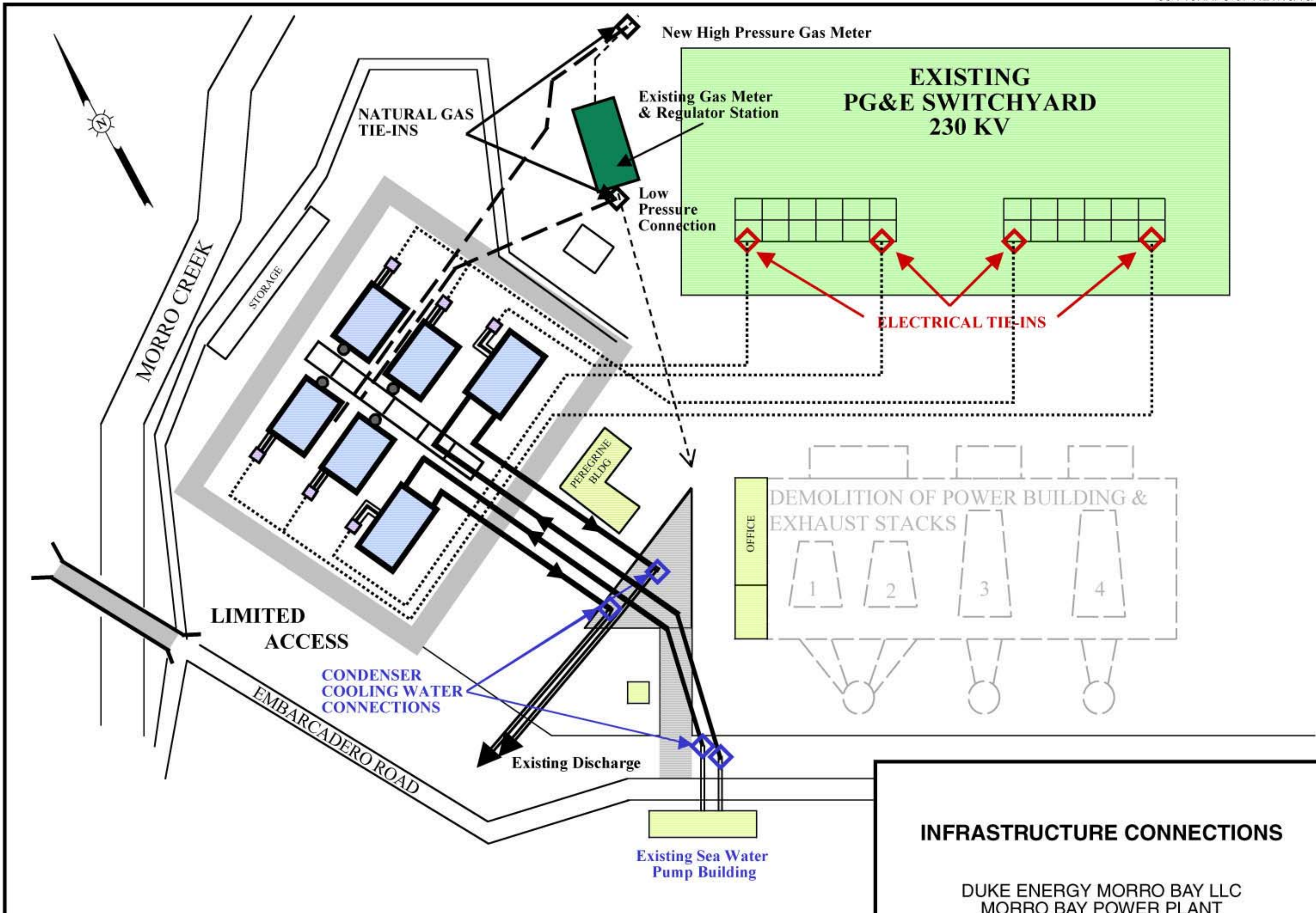
FIGURE 2-12



SOURCE: DUKE ENERGY, 2000.

INFRASTRUCTURE CONNECTIONS

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MORRO BAY POWER PLANT

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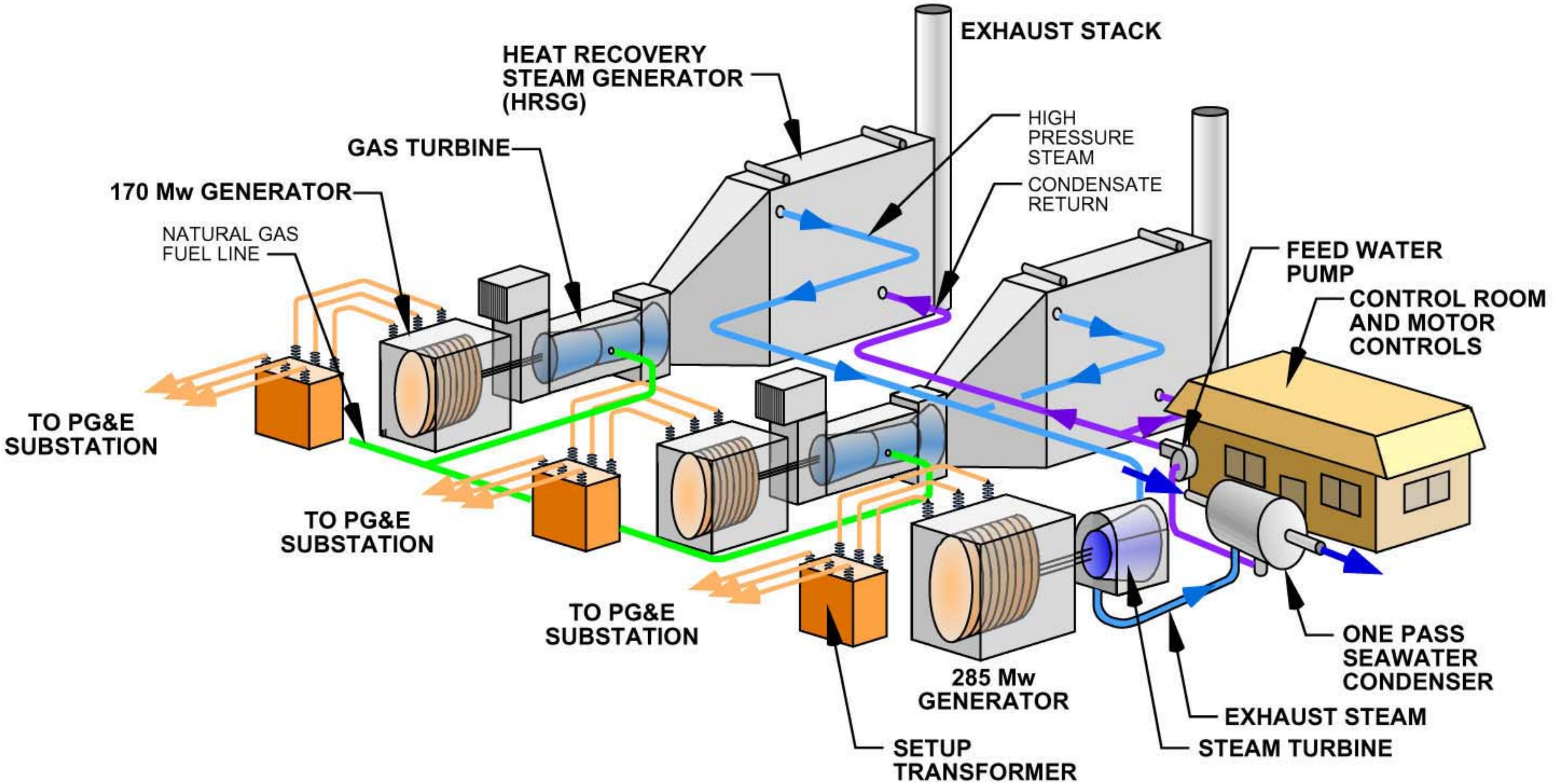
FIGURE 2-13



SOURCE: DUKE ENERGY, 2000.

SCHEMATIC
600-MW COMBINED-CYCLE UNIT

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FIGURE 2-14

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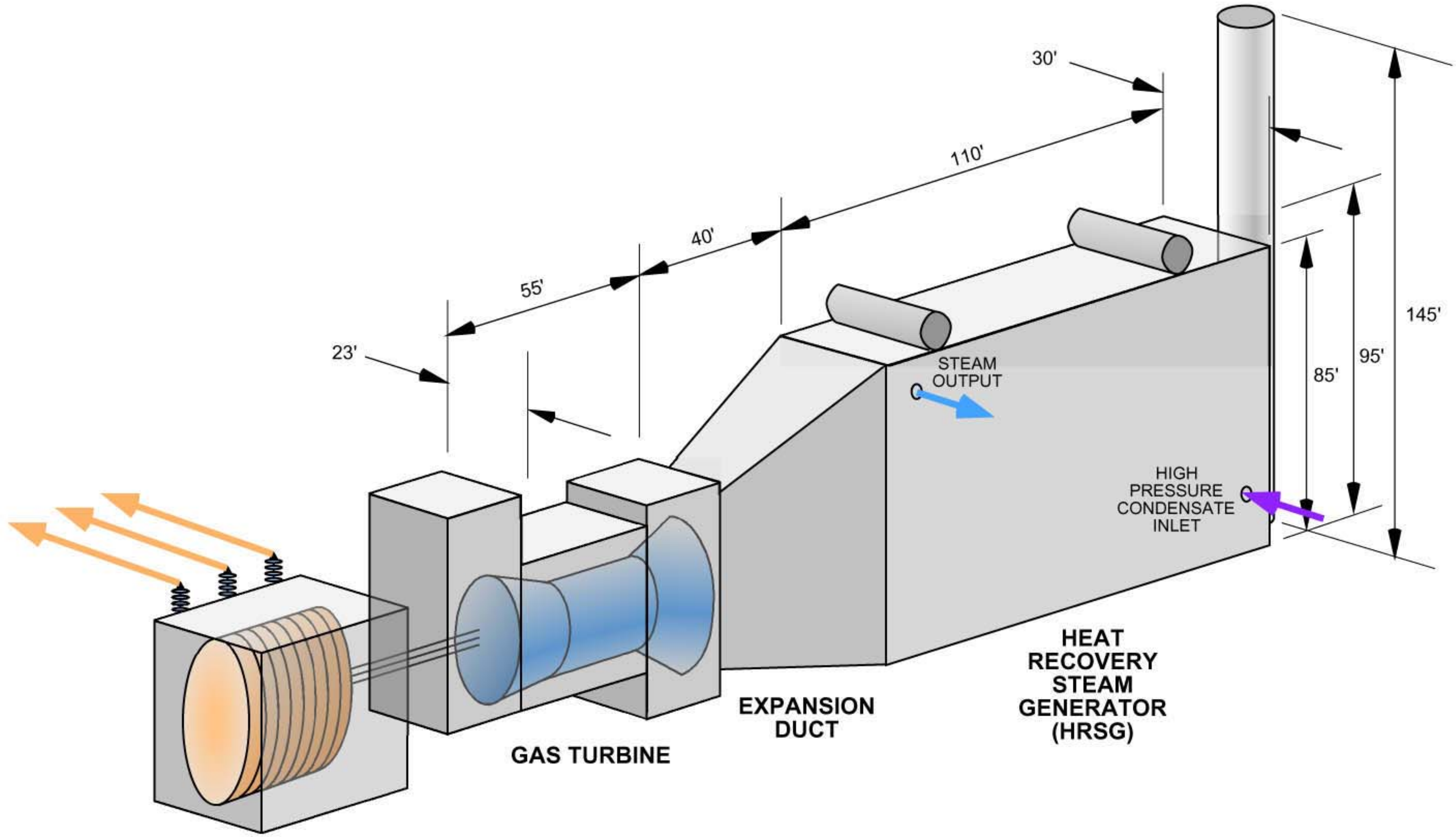

SOURCE: DUKE ENERGY, 2000.

DIMENSIONS
COMBINED-CYCLE UNIT

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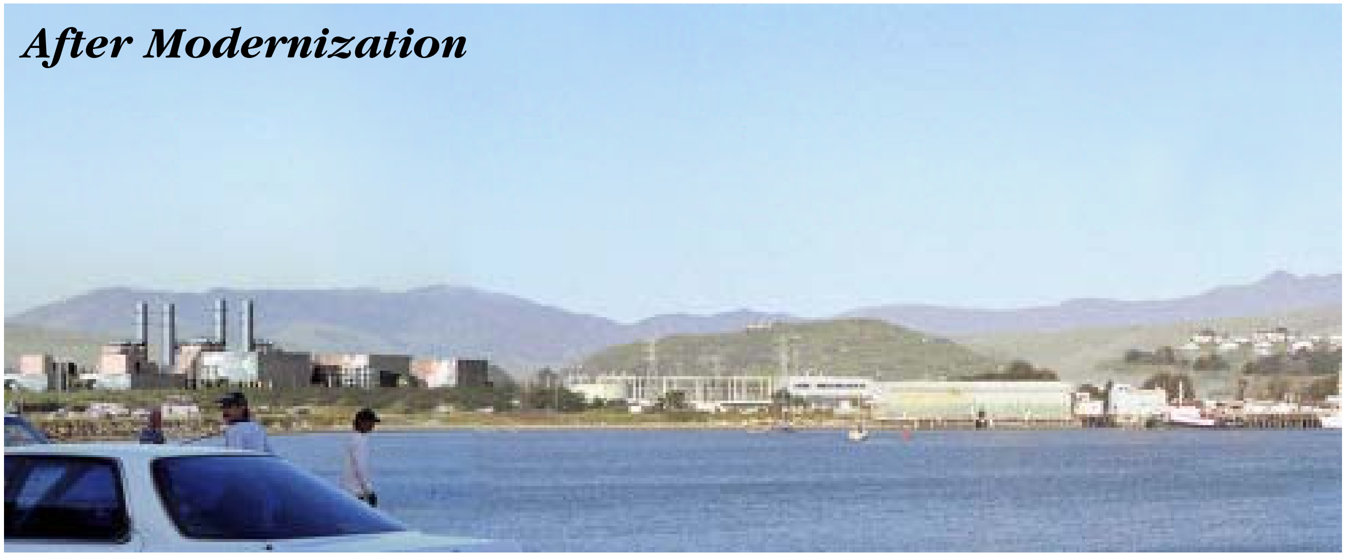
FIGURE 2-15



Summary of Visual Changes:

- Removal of existing power plant and stacks eliminates skyline contrast and improves views
- New view is opened to mountain ridgeline in the distance; Project is completely below ridgeline
- Proposed vegetation will further screen project

PROJECT PHOTO SIMULATION VIEW: BASE OF MORRO ROCK

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

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FIGURE 2-16

SOURCE: DUKE/FLUOR DANIEL AND EDAW, INC., 2000.

Project. The area also includes an 18-feet high earthen berm surrounding the entire fuel oil storage tank area. Duke Energy intends to use materials from the interior berms to further build up the exterior berms, which will then serve as a natural visual screen for near views and lower sections of the Project.

Due to its continuous industrial use, the site contains very little vegetation and will require only minor grading. Although the site is located in the 100 year Flood Plain as delineated in the 1985 Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), it has historically not been subject to flooding. To participate in the National Flood Insurance Program ("NFIP") administered by FEMA, local communities must adopt and enforce flood hazard prevention ordinances. The City of Morro Bay has adopted a Flood Damage Prevention Ordinance (Morro Bay Ordinance No. 477, codified at Ch. 14.72 MBO). As required by Ordinance No. 477, Duke Energy will apply for a City of Morro Bay development permit and meet applicable standards and requirements as provided by said ordinance. The applicable FEMA models, and recently collected detailed topographic data, will be used to ensure that: 1) the Project does not adversely affect the flood carrying capacity of Morro Creek and the base flood water surface elevation adjacent to or upstream of the Project area; and 2) the Project area and structures, including the levee system are a) reasonably safe from flooding; and b) complies with standards for anchoring, construction materials and methods, as well as elevation and flood-proofing. In the alternative, one or more requests will be submitted to FEMA to ensure that the applicable FIRM is amended or revised to reflect that the Project area is situated above the base flood elevation and, as may be necessary, the dikes and berms (levee) surrounding the Project area will be modified to meet construction and maintenance standards established by FEMA. [44 C.F.R. § 65.10(b)].

Ground water depth ranges from 5 to 15 feet below the ground surface, flows toward Morro Bay, and is influenced by ground water pumping and tidal fluctuations. Site drainage will be designed and constructed to comply with applicable stormwater run-off permit requirements. (Additional information regarding site grading and drainage can be found in Section 8.2.1 - Site Grading and Drainage).

Climatic conditions are typical of the Site's coastal location. The prevailing wind direction is northwest from the Pacific Ocean. The annual average temperature ranges from the low 50s into the 70s. Rainfall averages 16 inches per year.

The MBPP is located along the coastal edge of the Santa Lucia Range adjacent to Morro Bay. Franciscan Assemblage rocks form a thick geologic basement of the Santa Lucia Range.

Approximately 5 to 15 feet of artificial fill, consisting of primarily sand and gravel, lie beneath MBPP. This artificial fill was placed by the U.S. Army Corps of Engineers in the 1940s on Holocene age alluvium and bay deposits consisting of sand, gravel and marine clay with underlying sandstone and shale deposits. (Additional information regarding site geology can be found in Section 6.3 - Geologic Hazards and Resources.)

2.2.3 DESIGN, CONSTRUCTION AND OPERATION OF THE FACILITY

The following sections describe the Project layout and the processes, systems, and equipment that constitute the Project. A detailed engineering discussion is provided in Chapter 8.0 - Engineering. The facilities will be designed and constructed in accordance with the design criteria provided in Appendices 8.1 through 8.8.

2.2.3.1 Power Generation

The Project, employing combined cycle technology, will produce power from:

- The combustion of natural gas and the initial expansion of those gases through a combustion turbine.
- The additional use of that heated exhaust gas to heat water into steam, which expands within a steam turbine.
- Duct-firing of natural gas in the HRSG to generate additional steam for the turbine to meet peak capacity requirements.

This technology and its component parts are described below:

2.2.3.2 Process Description

The combined cycle units produce electricity from the expansion of heated compressed air and the expansion of steam. Combustion of natural gas provides the thermal energy that a CTG converts into mechanical energy driving an electric generator. Heat from the combustion turbine exhaust gas is recovered in an HRSG that produces STG. Additional peak load capacity can be generated by the steam turbine when natural gas is duct-fired in the HRSG to create more steam. The combustion turbine thermodynamic cycle is called the Brayton cycle. The steam turbine thermodynamic cycle is called the Rankine cycle. When both cycles are integrated in the same thermodynamic system, the resulting plant is commonly referred to as a "combined-cycle" plant. Figure 2-14 depicts a single combined-cycle unit. For this Project, two combined cycle units will be constructed (see Figure 2-6).

2.2.3.3 Combined-Cycle Unit's CTGs, HRSGs, and STGs

This section describes the major components of the Project. More detailed information is included in Chapter 8.0 - Engineering and its appendices.

Combustion Turbine-Generators

Each combined-cycle unit includes two natural gas-fired General Electric model PG7241 "7FA" CTGs operating in combined-cycle mode with auxiliary systems, producing approximately 618 MW Gross at summer design point of 64.1° F ambient (or at 57° F annual average) when duct firing system is activated. For plant performance and emissions data, see Appendix 8.1.

Each CTG consists of a stationary CTG and the following associated auxiliary equipment:

- Starting package
- Electrical/control package
- Inlet air system, including silencer
- Exhaust system
- Lube oil system
- Gas fuel system
- Compressor wash system
- Surge protection equipment
- Potential transformer cubicle
- Fire protection system

Heat Recovery Steam Generators

The combined-cycle unit is a 2 on 1 configuration (two combustion turbines with the associated two HRSG supplying steam to one steam turbine generator). Each combustion turbine will exhaust to a dedicated HRSG.

Each HRSG is a horizontal, natural circulation type unit with three pressure levels of steam generation and a reheat loop. Duct firing is provided to maximize steam turbine output. At maximum output, high-pressure steam at 1,725 pounds per square inch gage (psig) and 1,055º F is produced in the HRSG and flows to the steam turbine throttle inlet. The exhausted cold reheat steam is mixed with intermediate pressure steam and reintroduced into the HRSG through the reheat loop. The hot reheat steam flows back from the HRSG into the STG. Reheating steam improves the steam turbine cycle efficiency because it greatly reduces the formation of liquid water in the low-pressure sections of the steam turbine. A steam turbine converts the expansion energy of steam to shaft power. When steam becomes liquid in the low-pressure sections of the turbine rather than the condenser, the potential expansion energy of the steam that becomes liquid is not available to make power.

Low pressure superheated steam from the HRSG is admitted to the low-pressure sections of the STG. The electric generator driven by the STG produces approximately 285 MW at maximum output.

STG exhaust steam is condensed in the surface condenser by heat exchange with seawater. The cold seawater passes through tubes in the condenser while the hot steam condenses on the outside of the seawater tubes. The water created from the steam in the condenser is then recovered and reused in the HRSG.

Steam Turbine Generators

STG systems include a reheat steam turbine-generator, governor system, steam admission system, gland steam system, lubrication oil system including oil coolers and filters, and generator coolers. Steam from the high-pressure (HP) superheater, reheater, and intermediate-pressure (IP) superheater sections of the HRSG enters the corresponding sections of the STG as described previously. The steam expands through the turbine blading to drive the steam turbine and generator. Upon exiting the turbine, the steam enters the condenser, is condensed as demineralized water, pressurized and circulated back to the HRSG to be reheated to produce steam.

2.2.3.4 Major Electrical Systems and Equipment

Almost all of the power produced by the Project will be delivered to MBPP's interconnection with the existing PG&E Morro Bay Switchyard. A small amount, about 2.9 percent will be used onsite for plant auxiliaries such as pumps, control systems, and general facility loads including heating, ventilation, and air conditioning (HVAC) and lighting. Some will also be converted from alternating current (AC) to direct current (DC) for control systems and emergency backup systems. The description of the major electrical systems and equipment is provided in Chapter 8.0 - Engineering and Appendix 8-6.

2.2.3.5 Power Plant Operation

The Project will be controlled and operated by five individuals during each operating shift for the combined-cycle units (total of 20 Operators staffing 4 crews of 5 Operators per crew). Additional maintenance and supervisory personnel will be present during the day shift (total of 20 Management, Supervisory and I.B.E.W. represented Technical craft employees) and, as required by specific operations or maintenance activities, during evening and night shifts. The Project will be a significant force in maintaining current levels of employment at MBPP. The Project will be operated up to 7 days per week, 24 hours per day. When the Project is not operating, personnel will be present as necessary for maintenance and to prepare the Project for startup. During extended outages when no operations or maintenance activities are in progress, at least one individual will be on-site during all hours for security purposes.

Overall annual availability of the Project is expected to be approximately 90 percent or greater. The Project's capacity factor will depend on the demand for electricity, ancillary services, and natural gas. The design of the Project provides for operating flexibility (i.e., ability to start up, shut down, turn down, and provide peaking output) so that operations may be readily adapted to changing conditions in the energy and ancillary services markets. Each combined-cycle unit will be permitted for up to 400 hours of start-up time per year.

2.2.3.6 Water Systems

Utilization of seawater for cooling will be dramatically reduced as a result of the new units. At maximum capacity, the seawater utilization per MW at MBPP will decrease by 40 percent when the new units are on line. The Project will also include replacing the existing Cooling Water Pumps with new Cooling Water Pumps of lesser capacity that can be operated as necessary for unit loading conditions which will effectively result in variable flow. This design technology will result in cooling water flow being reduced when steam turbine output is reduced from peak loading to base loading which will assure that only the amount of cooling water necessary for designed unit performance is being used. The Project will have the following four water systems:

- A once through cooling water system, using seawater.
- An auxiliary cooling system (closed loop system to cool equipment, which is itself cooled by seawater).
- A condensate and boiler feed water system.
- A fire and potable water system.

Onsite wells provide water for fire protection, service, landscaping and potable water. Therefore, these systems are discussed jointly below.

Cooling Water System

Units 1 through 4 steam turbine condenser and other plant cooling requirements are met by once-through seawater cooling. Approach velocity at the bar rack will be reduced to approximately 0.3 fps, based on 1999 measured data, which will minimize impacts on sea life. The existing plant operates with an average intake approach velocity of approximately 0.45 fps.

Cooling water to one 600 MW unit of the Project will be provided using seawater from the existing intake structures used for Units 1 and 2. Cooling water to the second 600 MW unit will be provided using seawater from the existing intake structure used for Units 3 and 4. Development of the Project will include certain modifications (see Appendix 8-2) to bring the seawater to the site. The condensers cool and condense the steam after it exits the steam turbine. The average cooling water demand for each combined cycle unit is expected to be approximately 165,000 gpm when the unit is producing maximum output. Traveling Screens now serving Units 1 through 4 will be refurbished. New cooling water supply pumps will be installed in the existing intake structure.

2.2.3.7 Non-cooling Water Supply and Treatment

The primary demand for non-cooling water will be for makeup water to the steam cycle to replace HRSG blowdown and steam losses. Demineralized water will be used for this purpose. The average makeup water demand will be about 57,600 gallons per day (gpd) per combined-cycle unit operating at 100 percent capacity. Approximately 40,300 gpd is recovered blowdown and approximately 17,300 gpd is distilled water, which is generated from the seawater evaporator. The demineralized water is collected and stored in the demineralized water storage tank. Blowdown is either recovered directly to the demineralizer or wasted to the seawater outlet.

For the Project, makeup water for the combined-cycle units will come primarily from seawater, which has been desalinated by an existing vapor compression evaporator system followed by a polishing demineralizer. The polishing demineralizer system is supplied by a contractor and requires no onsite chemicals for regeneration. The contractor conducts the regeneration offsite, in compliance with State approved waste disposal requirements. Boiler blowdown is also collected and demineralized. Both demineralized water streams are collected and stored in the demineralized water storage tank. Demineralized water is used for steam cycle make-up, for periodic water wash of the combustion turbine, and make-up to other combined-cycle systems requiring high purity water.

Potable water will be supplied from the onsite well water system to a hypo-chlorinator located in the Switching Center Basement, on PG&E property. The potable well water will be used for toilets, showers, emergency eye wash and shower stations, while bottle water will be used for drinking. Well water will additionally be used for landscaping and fire suppression. Further analysis of water supply, use and impacts is provided in Section 6.5 - Water Resources.

2.2.3.8 Waste Handling and Control

Wastes generated in conjunction with operation of the Project will include wastewater, solid non-hazardous waste, and hazardous waste. Collection and handling of wastewater is discussed in the following paragraphs. Further information on waste handling and control is provided in Section 6.15 - Hazardous Material Handling.

Wastewater

Operation and maintenance activities will generate a variety of non-hazardous wastewater. These include, but are not limited to, intake screen wash, evaporator blowdown, bearing cooling water, storm water, floor drain water, and other liquids resulting from routine operation and maintenance. It is anticipated that most of the non-hazardous wastewater generated will be discharged through existing cooling water outfall. Some liquids will require treatment prior to discharge. For example, some solutions will require neutralization to achieve allowable pH limits, and process wastewater and stormwater run-off with the potential to contain oil will be routed through an oil/water separator. This wastewater will be collected in the oily wastewater sump then pumped through the oil/water separator to remove the oil.

Discharges will comply with applicable regulations and the National Pollutant Discharge Elimination System (NPDES) permit to be issued by the Central Coast RWQCB. Permit conditions will specify parameters including, but not necessarily limited to, flow, temperature, organic and inorganic constituents, oil and grease, floating and suspended materials, and aesthetic properties. Routine monitoring and reporting of discharges will assure compliance with regulations and permit conditions.

The MBPP already has a Storm Water Pollution Prevention Program (SWPPP) for ongoing operations that will be amended to include the Project. Stormwater run-off will be managed in accordance with the SWPPP designed to: 1) identify potential sources that may affect the quality of stormwater run-off; and 2) identify, assign and implement control measures and management practices to reduce pollutants in stormwater discharges.

Stormwater run-off from industrial areas of the site is routed through an oil/water separator before it is discharged to the cooling water outfall. Stormwater from roof drains and storm drains also goes through an oil/water separator. The Project will conform with the existing SWPPP. If necessary, the SWPPP will be amended to incorporate specific operations and pollution prevention practices for the Project. Currently, no stormwater sampling or monitoring is required at MBPP.

An existing sanitary lift station sends sewage waste from the existing facility to the local sewer system. The Project will also use this lift station. No additional capacity will be necessary because only a minimum of new regular employees will operate the facility.

Solid, Non-hazardous Waste

Operation and maintenance of the Project will produce solid, non-hazardous waste typical of power generation operations. Equipment operation and maintenance will generate broken, defective and degraded parts, empty containers, wood pallets, packaging and other spent materials. Supporting administrative activities and MBPP site personnel will generate paper, cardboard, food waste and other discards. Wastes suitable for recycling will be recycled. Non-hazardous wastes that are not recycled will be disposed of through the local waste-disposal company. Solid non-hazardous waste will be managed in accordance with applicable regulatory requirements to minimize health and safety impacts.

Hazardous Waste

Operation and maintenance of the Project will generate a variety of wastes that will meet the California Code of Regulations (CCR) Title 22 criteria for hazardous waste. Most of these wastes are produced in very small amounts. Examples may include waste oil, used oil filters, certain chemical wash solutions, spent solvents, spent paint materials, waste sand blast, spent batteries and spent fluorescent light tubes. Hazardous waste handling procedures in accordance with federal and state regulations are well established at MBPP due to these types of wastes being generated by similar ongoing activities. The existing facilities include designated hazardous waste storage areas with appropriate drainage and environmental controls.

The Project will have designated satellite accumulation stations that will be operated in accordance with CCR Title 22 requirements. Appropriate maintenance and other personnel will be trained to recognize and handle hazardous wastes generated at the site. Hazardous waste will be recycled or disposed in accordance with CCR Title 22.

2.2.3.9 Management of Hazardous Materials

A variety of hazardous reagents and materials will be stored and used at MBPP in conjunction with operation and maintenance of the Project. In general, the type and character of these materials will be the same as for comparable current operations. Hazardous materials that will be routinely stored in bulk and used for the Project include aqueous ammonia, petroleum products, flammable and compressed gases, acids and caustics, water treatment and cleaning chemicals, paints, and solvents.

Storage, handling and use of hazardous materials will be in accordance with applicable LORS. Bulk tanks will be provided with secondary containment to hold leaks or spills. Safety showers and eyewashes will be provided in appropriate chemical storage and use areas. Personnel who may potentially handle hazardous materials will be trained to perform their duties safely and to respond to emergency situations that may occur in the event of an accidental spill or release.

The MBPP has a current Hazardous Materials Business Plan/Contingency Plan in accordance with CCR Title 19, a current Spill Prevention Control and Countermeasure Plan (SPCC) in accordance with Title 40, CFR, Part 112.7, and a SWPPP in accordance with RWQCB requirements.
In addition, the Project will prepare a Risk Management Plan (RMP) for aqueous ammonia in accordance with the requirements of the California Accidental Release Prevention Program. Each of these management plans includes detailed measures designed to prevent or respond to discharges, spills, leaks or other incidents involving hazardous materials. The Project will be designed in accordance with measures described in these existing management plans, or the existing plans will be updated for the Project, if required. Additional descriptions of handling of hazardous materials can be found in Section 6.15 - Hazardous Material Handling.

2.2.3.10 Pollution Control and Monitoring

The San Luis Obispo Air Pollution Control District administers both state and federal air quality LORS at the plant. Air emissions from the combustion of natural gas in the Project's new combined-cycle units will be controlled using state-of-the-art systems. To assure that the systems perform correctly, a Continuous Emissions Monitoring System (CEMS) will monitor NO_x, carbon monoxide (CO) and diluent gas. SCR in the HRSG will control NO_x emissions. An oxidation catalyst will be used to control carbon monoxide emissions. Air filtration and the use of natural gas will control particulate emissions.

The SCR system consists of the reduction catalyst and an aqueous ammonia injection system. The catalyst and ammonia injection grid are arranged within the HRSG so that the ammonia injected into exhaust gases will combine with the NO_x in the presence of the catalyst to reduce the NO_x in the HRSG stack gas to a maximum of 2.0 ppmvd (adjusted to 15 percent O_2). Aqueous ammonia solution (approximately 29 percent ammonia by weight) is vaporized and injected into the hot exhaust gas path of the HRSG at a point upstream of the SCR to assure proper distribution over the catalyst. The ammonia vapor and the NO_x chemically combine in the presence of the SCR catalyst to form nitrogen gas and water vapor.

Fine particulate matter with aerodynamic diameter less than or equal to 10 micrometers (PM_{10}) emissions are controlled by the use of good combustion practices and natural gas fuel. PM_{10} emissions consist primarily of carbon and sulfate particles formed during combustion and may be up to a maximum 11 pounds per hour per CTG.

The sulfur dioxide (SO_2) emissions are controlled by the use of natural gas fuel, which contains only trace quantities of sulfur. A complete analysis and discussion of the air quality impacts of the Project are provided in Section 6.2 - Air Quality.

2.2.3.11 Safety, Emergency, and Auxiliary Systems Safety

Safety

The Project will be designed, operated and maintained to comply with applicable Occupational Safety and Health Administration (OSHA) regulations and standards for worker health and safety, and other applicable LORS for environmental and public health and safety. The Project will have fire protection and suppression systems designed to meet current standards and specifications, which will be an improvement over the design standards and specifications that were in place when Units 1 through 4 were constructed. Ancillary facilities and equipment necessary for safe and efficient operation will be provided. Facility operators will be trained to perform their duties and conduct themselves in a manner designed to prevent unsafe conditions. Duke Energy will conduct initial safety training and periodic refresher safety training, in accordance with OSHA regulations. Further discussion of safety systems is provided in Section 6.17 - Worker Safety.

Additional fire prevention resources are being proposed by Duke Energy as part of the Project to address potential shortfalls in manpower and other resource requirements within the City of Morro Bay Fire Department. Duke Energy proposes that this "Fire Safety Program" will ensure that the City can fulfill several functions during the life of the Project, including:

- Emergency response, if required.
- Plan Check responsibilities once construction plans are available.
- "Command and Control" and overall management responsibilities.
- Inspection and training requirements.

Cathodic protection for underground systems will be provided, as required by the post construction soil analysis. A system for intra-plant communication will be provided, as well as plant lighting and emergency lighting.

Seismic Safety

Active faults are not known to occur on or adjacent to MBPP, but strong ground shaking is possible from distant faults. Geotechnical and seismic conditions will be evaluated as part of the design of the Project, and the Project will be constructed to comply with applicable seismic parameters and building codes (i.e., Seismic Zone 4 of the California Building Code). Further analysis of geotechnical and seismic conditions is contained in Section 6.3 - Geologic Hazards and Resources.

Emergency Planning and Response

The MBPP maintains a current emergency response plan to maximize the potential for prompt and appropriate response to reasonably foreseeable emergency situations. The emergency response plan has been submitted to and approved by local emergency response agencies. It identifies designated emergency coordinators, contacts and response equipment, and addresses activities to be undertaken in the event of an explosion, fire, hazardous material release, earthquake and other potential emergencies. MBPP provides formal training for all employees at the facility to assure readiness of emergency response procedures. The existing MBPP includes audible alarm code systems, internal and external telephone communication systems, and other systems necessary to provide a comprehensive emergency response. These systems will be extended into the Project, as appropriate.

Complete fire protection will be provided for the Project. It will include fixed water fire suppression systems, fire hose stations, hydrants, portable fire extinguishers, detection and control systems, etc. It will be designed and installed in accordance with the National Fire Protection Association (NFPA) standards and recommendations. Engineering evaluation will determine whether the capacity of the fire system remaining after demolition of the fuel oil tank farm is sufficient. If reinforcement of the existing fire water system is required, it will be included in the final design documents. The fire protection system for the Project will be integrated into the existing MBPP fire protection system. This system consists of a 1-million gallon firewater storage tank and two diesel-fueled fire water system pumps.

Auxiliary Power

An uninterrupted power supply (UPS), consisting of a battery backup system, will be included to provide emergency backup power for the control systems. Normal backup power will come from the PG&E interface at the switchyard.

2.2.3.12 Fuel Types and Use

The Project will use clean-burning natural gas as the fuel. Fuel oil is no longer an alternative fuel at the MBPP. Natural gas fuel supply to MBPP is provided via PG&E's Line 306 from Kettleman Compressor Station, approximately 70 miles from MBPP. The Project will connect upstream of the existing Primary Gas Regulator Station to provide fuel for the new gas turbines. The regulator station reduces the pressure to 100 psig flows through PG&E's Master Meter Station (which provides flow data and gas constituent information) to supply the Secondary Gas Regulator Stations for each of the HRSG duct fire systems. The Project will require some onsite modifications to the existing natural gas Primary Gas Regulating Station and metering station. Fuel for the four proposed CTG's needs additional compression to meet the turbine manufacture's fuel pressure specifications. Further discussion of the fuel availability is contained in Section 8.5.1.

2.2.3.13 Project Civil/Structural Features

Civil and structural features include equipment and facility foundations and structures. All systems will be designed in accordance with applicable LORS. The CTGs, HRSGs, STGs, and condensers are located at grade elevation on reinforced mat foundations. The balance of plant mechanical and electrical equipment will be supported at grade elevation on individual reinforced concrete pads. Discussion of the individual structural features and their foundations is provided in Section 8.2 and Appendices 8.3 and 8.4.

2.2.3.14 Project Auxiliary Systems

Project auxiliary systems include lighting, grounding, DCS, cathodic protection, freeze protection, service air and instrument air systems. A description of each of these systems is contained in Section 8.4.1.

2.2.3.15 Construction

As shown in Figure 2-11, construction of the new combined cycle units is expected to take approximately 21 months, with commercial operation anticipated for the third quarter of 2003. Onsite construction of the Project is expected to begin in the first quarter of 2002. The peak construction and installation of the equipment is projected to occur in the fourth quarter of 2002. The Project will employ up to 831 workers during peak construction and an average of 348 workers over the 21 month period (see Figure 2-10). The on-site workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. The on-site workforce is expected to reach its peak during the tenth month of construction. Work on the pump house facade will commence after commercial operation of the new units and demolition of the existing 450-foot-tall stacks. The demolition of the existing power building will take about three years and will be completed by December 31, 2007.

As shown in Figure 2-17, construction support areas will be located onsite at MBPP. Several optional sites are under consideration for use as offsite material holding, laydown and marshalling areas. Duke Energy is pursuing leases for approximately 10 acres near a rail siding for temporary holding of large HRSG components and approximately 20 acres for a marshalling area. The marshalling area will be the preferred delivery site for most large truck deliveries. A dedicated crew will then transport the material to the Project site so that onsite laydown space is coordinated with the needs of the Project construction schedule. This plan will locate the offsite laydown areas south of the Project site and outside the City of Morro Bay, adjacent to Highway 1 which will enable coordination of truck traffic to the site. The proposal will also eliminate truck traffic to the site by drivers who may be unfamiliar with the traffic circulation plan or arrive during peak street traffic times.

Construction access will be provided via three routes (as shown in Figures 2-18 through 2-20). Construction workers will enter the site from Highway 1 by taking the Main Street exit turning right onto the road along the back of MBPP and entering the site through the back gate along the PG&E Morro Bay Switchyard. Construction workers will leave the site through an exit at the southwest corner of the site, crossing the new bridge, following the road to the right and continuing on what has now become Atascadero Road and then Highway 41 to Highway 1. Oversized and heavy loads will enter and exit the site from Highway 1 exiting at Morro Bay Boulevard, turning right on Quintana Road to Main Street, turning right on Main Street and then left into the back access to MBPP (see Figure 2-21). Further analysis of construction traffic is provided in Section 6.11 - Traffic and Transportation. Equipment and materials will be delivered to the site by truck and by rail to San Luis Obispo. Construction will typically take place between the hours of 6 a.m. and 4 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. During the start-up and testing phase of the Project some activities may continue 24 hours a day, 7 days a week.

Estimates of the average and peak construction traffic during the on-site construction period are discussed in Section 6.11 - Traffic and Transportation.

2.2.3.16 Site Grading and Drainage

The site grading and drainage system will comply with applicable federal, state, and local regulations. The general site grading will establish a working surface for construction and plant operating areas, provide positive drainage from buildings and structures, and provide adequate soil coverage for underground utilities (see Figure 2-22).

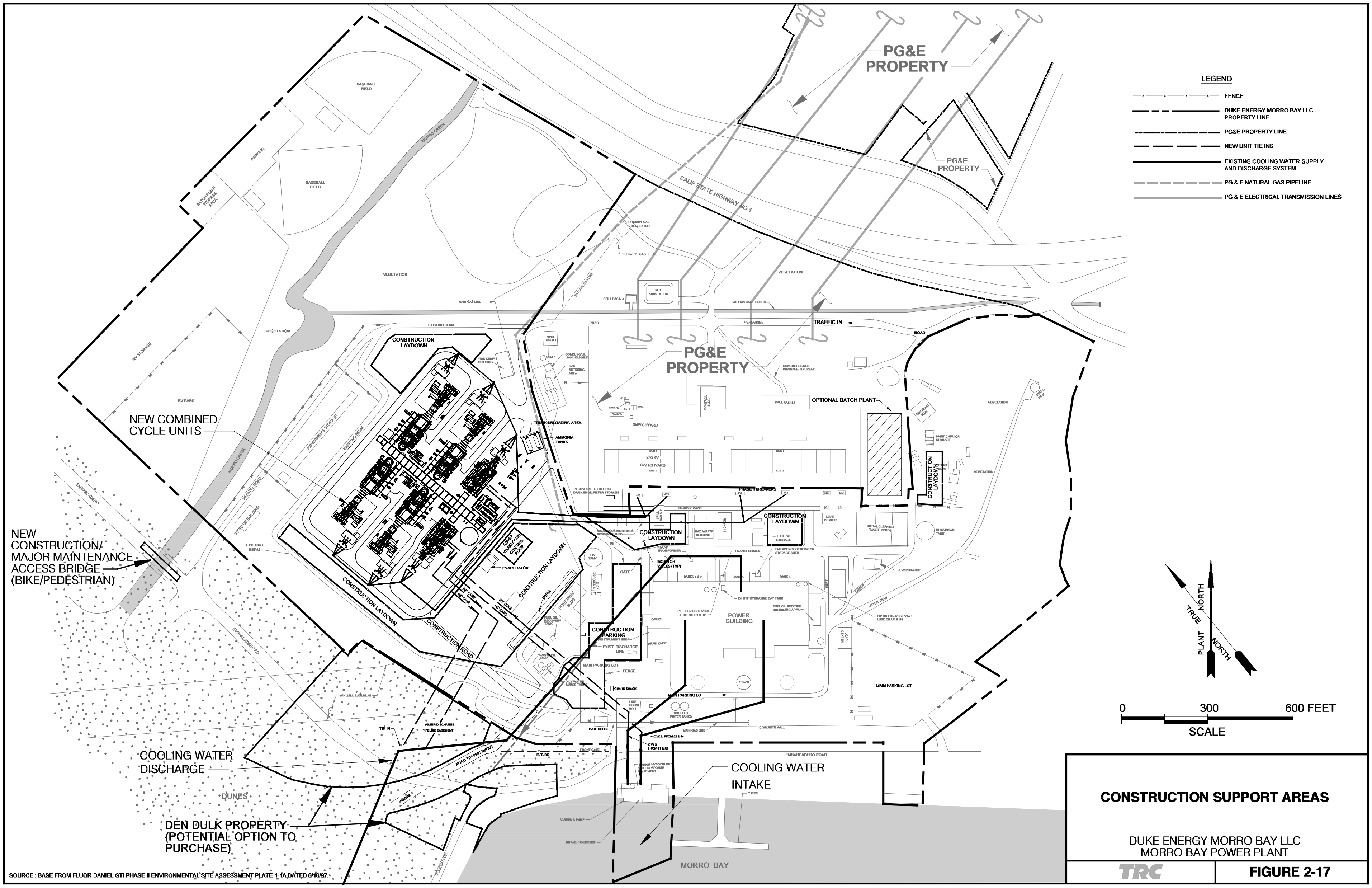
Onsite drainage will be accomplished through gravity flow whenever possible. Surfaces will be graded and sloped to provide drainage. The buildings and structures will be located with the ground floor elevation a minimum of 6 inches above the finished grade. The preferred slope of the graded areas away from structures will be 2 percent with a minimum slope of 1 percent. A storm sewer system (inlets and underground pipes) will be provided in areas where ditches are not feasible.

Site drainage facilities will be designed for the flow resulting from a 100-year, 24-hour rainfall. Temporary facilities will generally be designed for a 2-year rainfall (see Figure 2-23). In addition, drainage facilities will be designed to prevent flooding of permanent plant facilities during a 100-year storm.

The main plant area will be graded with moderate slopes (1 percent minimum preferred) for effective drainage. Drainage ditches will be designed to convey the 100-year, 24-hour rainfall run-off flow without producing a headwater elevation above the bottom of the roadway base course.

2.2.4 TRANSMISSION LINES

The Project will connect to the existing adjacent PG&E Morro Bay Switchyard. The Project does not require any additional transmission line construction, except for short generation ties within MBPP necessary to convey power to the switchyards (see Figure 2-14). The existing PG&E switchyard will only require minor equipment modifications to accept the proposed power generation units. The power grid is adequately sized and maintained for the additional power generated by the Project. The current proposal for the Project will connect the Gas Turbine Generators of one combined cycle unit into the 230-kV system at the same location currently occupied by Unit 1. The Steam Turbine Generator of that unit will connect into the 230-kV system at the same location currently occupied by Unit 2. The Gas Turbine Generators and Steam Turbine Generator of the second combined cycle unit will connect into the 230-kV system at the same



CONSTRUCTION SUPPORT AREAS

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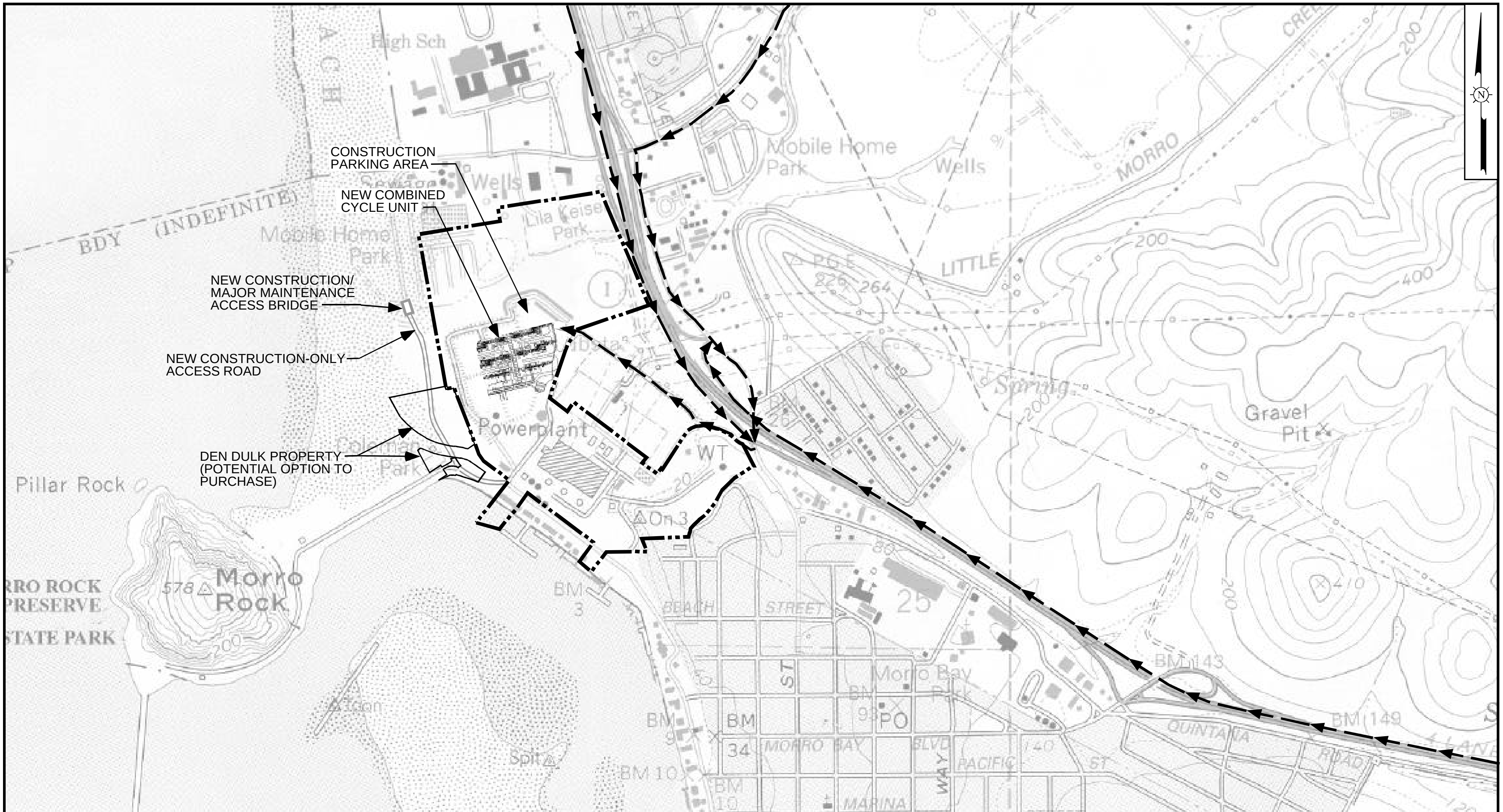
FIGURE 2-17

98-710RAFC-116 REV.10/14/00



LEGEND

DIRECTION OF TRAVEL

REFERENCE: USGS 7.5 MINUTE TOPOGRAPHIC MAPS OF MORRO BAY NORTH AND MORRO BAY SOUTH, CALIFORNIA, DATED 1993 AND 1994.

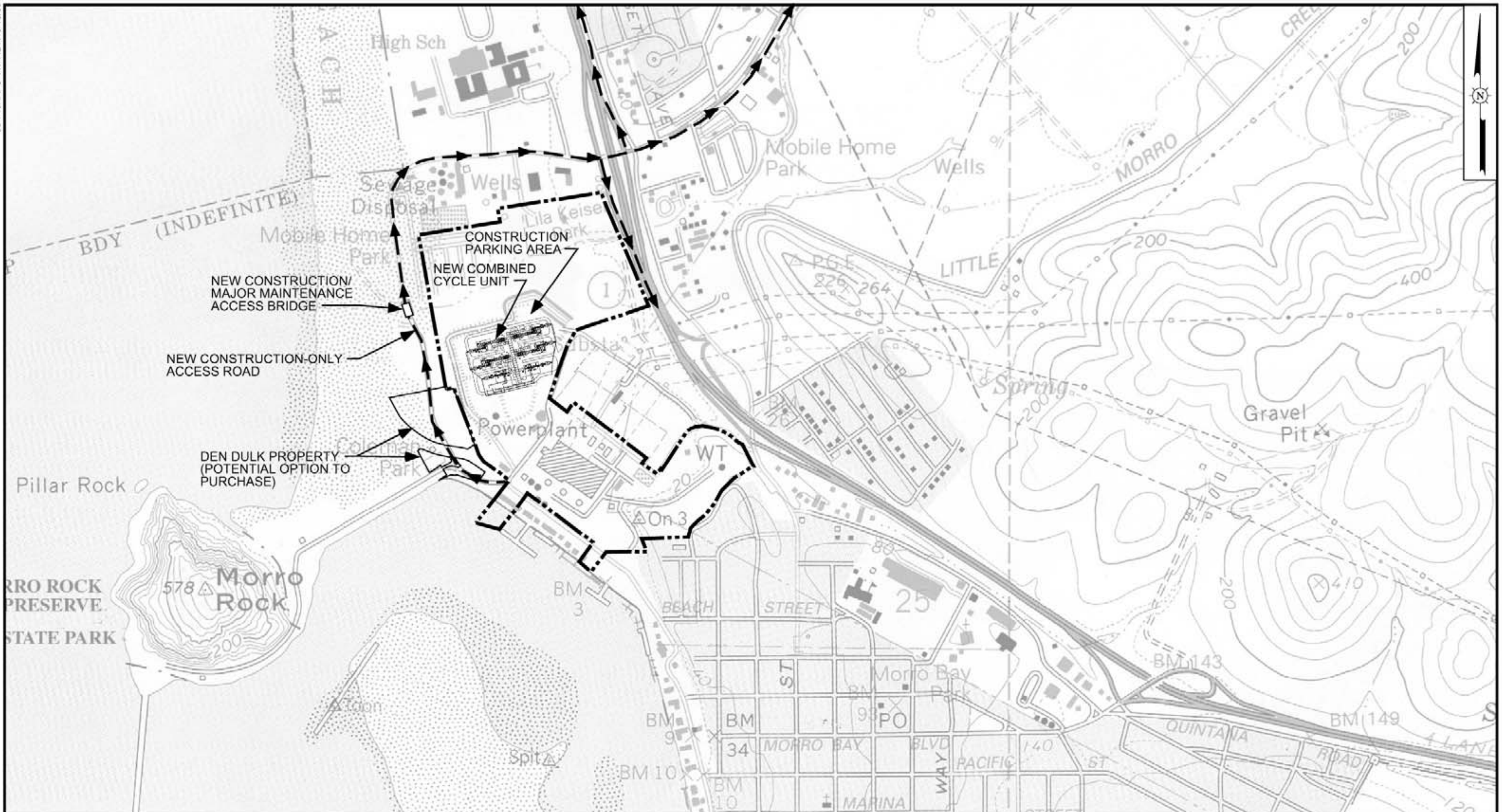
0 1/4 1/2 MILE
APPROXIMATE SCALE

A.M. CONSTRUCTION EMPLOYEE INBOUND ROUTE

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-18



LEGEND

DIRECTION OF TRAVEL

REFERENCE: USGS 7.5 MINUTE TOPOGRAPHIC MAPS OF MORRO BAY NORTH AND MORRO BAY SOUTH, CALIFORNIA, DATED 1993 AND 1994.

0 1/4 1/2 MILE
APPROXIMATE SCALE

P.M. CONSTRUCTION EMPLOYEE OUTBOUND ROUTE

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

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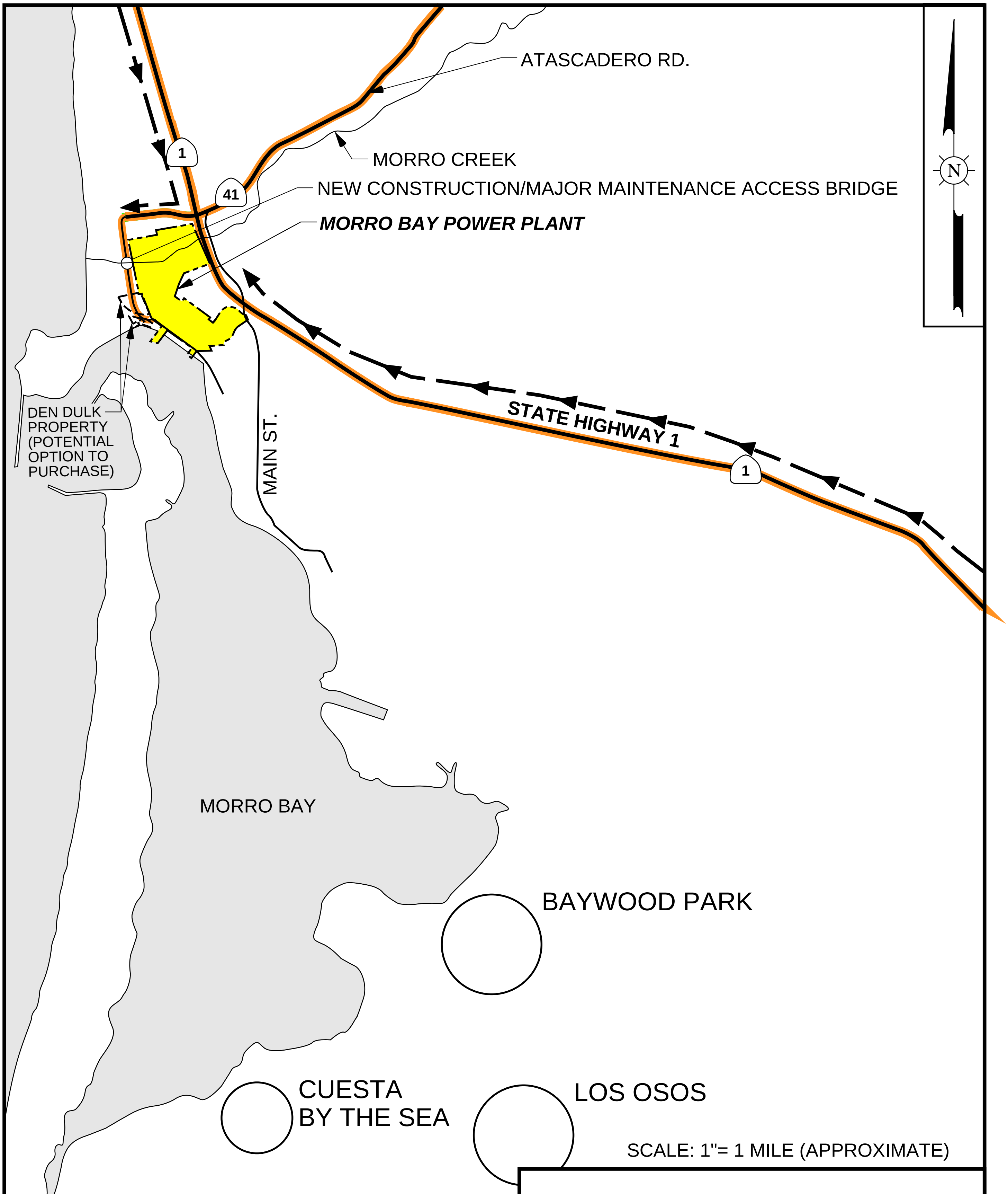
FIGURE 2-19

98-710RAFC-140 REV.10/18/00



LEGEND

DIRECTION OF TRAVEL

CONSTRUCTION DELIVERY ROUTE

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

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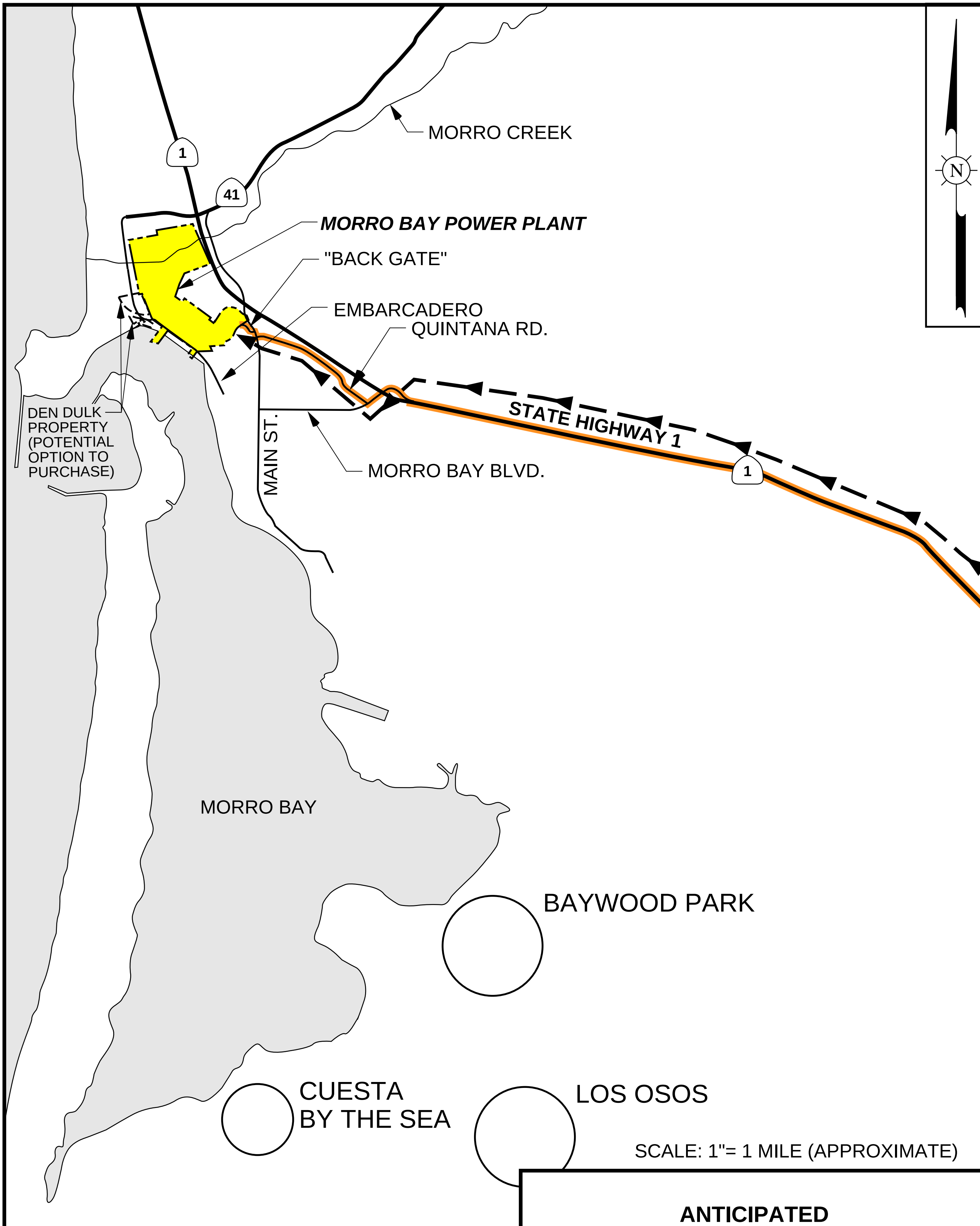
FIGURE 2-20



LEGEND

DIRECTION OF TRAVEL

NOTE: HEAVY/OVERSIZED LOADS WILL REQUIRE APPROPRIATE PERMITS AND SCHEDULING WITH THE CALIFORNIA HIGHWAY PATROL AND THE CITY OF MORRO BAY.

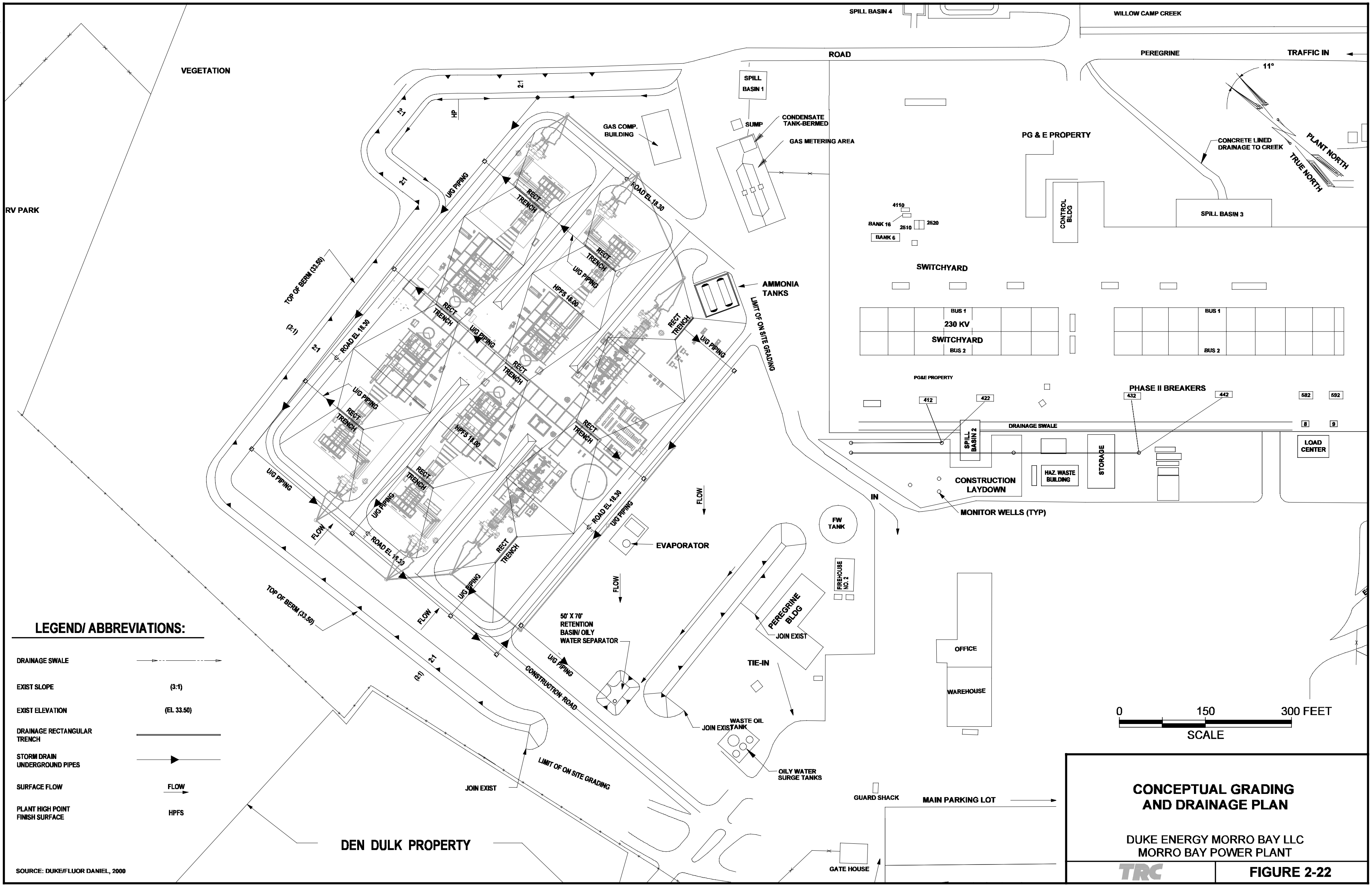
ANTICIPATED HEAVY/OVERSIZE EQUIPMENT TRANSPORTATION ROUTE

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-21

98-710RAFC-142 REV. 10/18/2000



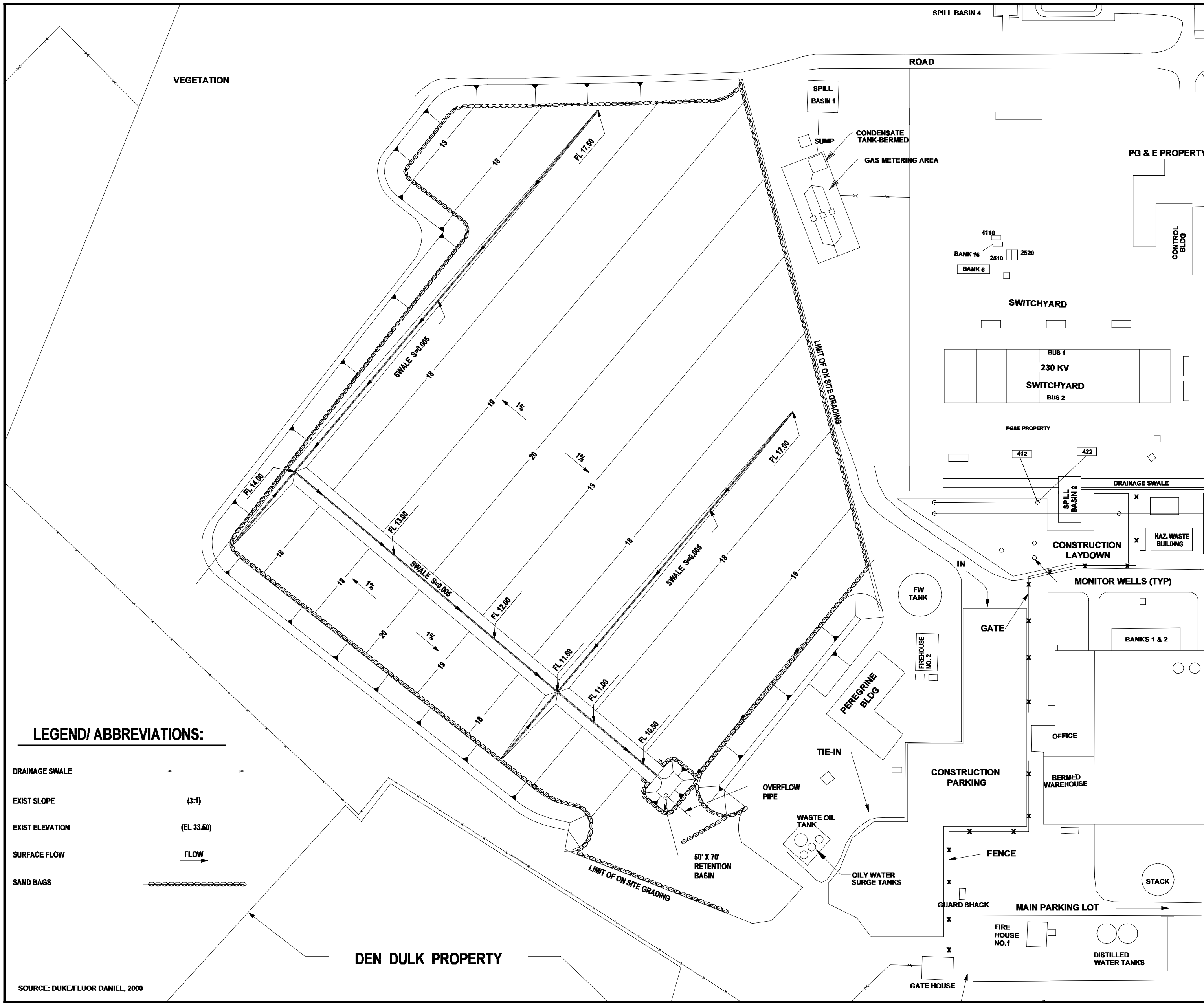
CONCEPTUAL GRADING AND DRAINAGE PLAN

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-22

98-710RAFC-143 REV. 10/16/2000



CONCEPTUAL INTERIM GRADING AND EROSION CONTROL PLAN

DUKE ENERGY MORRO BAY LLC
MORRO BAY POWER PLANT

TRC

FIGURE 2-23

locations currently occupied by Units 3 and 4, respectively. The PG&E switchyard will supply local loads through the 230/115-kV transformer just as those loads are supplied today. Additional discussion of this interconnection is contained in Section 8.4.

2.3 STACK AND POWER BUILDING DEMOLITION

In the final months before completion of construction of the new units, it is planned that the existing MBPP Units 1 through 4 will be shut down for the last time. During this time connection for the new combined cycle units to cooling water, natural gas fuel and switchyard infrastructure will be made. Several months will be needed to prepare the Units 1 through 4 and their auxiliary systems and equipment for salvage or demolition. During this time, a careful plant power disconnection procedure will be performed to assure that all "energized" connections are de-terminated, chemical systems are drained and flushed, hazardous materials are identified and abated and the power building is ready for safe decommissioning.

Figure 2-11 also shows the schedule for the power building demolition/stack removal activities. Figure 2-10 shows estimated manpower levels. As indicated, manpower levels are below 80 and generally steady throughout the power building demolition/stack removal activities. An average of 20 trucks per day will arrive and depart the site to remove demolished or salvageable material.

A detailed sampling and analysis program will be performed after cool down of Units 1 through 4 is complete. The purpose of the sampling and analysis program will be to identify hazardous materials, such as asbestos, lead and mercury that will require special handling. The sampling program will also allow for an inventory of the materials present at the existing plant and will facilitate more detailed planning for salvage or disposal of the equipment and power building structure. Table 2-4 provides a preliminary estimate of types of materials expected to be encountered, including rough estimates of the amounts expected to be salvaged, recycled or disposed of at an appropriate disposal facility.

Once sampling is complete and a detailed plan for salvage, recycling or disposal is finalized, decommissioning and demolition of the existing power building and stacks for Units 1 through 4 will commence and will be organized roughly as follows:

- <u>Asbestos/Hazardous Material Abatement</u> - This will occur sequentially, from unit to unit. Tenting will be erected inside the power building to shield areas that have completed asbestos (or other hazardous material) abatement from remaining areas. Areas with salvageable equipment are expected to be completed first, in order to allow for early removal and disposition.

TABLE 2-4

WASTE QUANTITIES FROM DEMOLITION OF EXISTING FACILITIES MORRO BAY POWER PLANT

WASTE TYPE	DISPOSITION AND WEIGHT (TONS)		
	Salvage	Recycle/Reuse	Dispose
Foundation Concrete, Asphalt and Soil	0	64,000	0
Other Building Materials, Equipment, Instruments	8,000	40,000	22,000
TOTAL	8,000	104,000	22,000

- Asbestos/Hazardous Material Abatement - This will occur sequentially, from unit to unit. Tenting will be erected inside the power building to shield areas that have completed asbestos (or other hazardous material) abatement from remaining areas. Areas with salvageable equipment are expected to be completed first, in order to allow for early removal and disposition.
- Salvage Activities - The generators are candidates for salvage and would likely be an early focus. Ancillary equipment related to salvageable material will also be removed, including possibly transformers.
- Salvage Activities - The generators are candidates for salvage and would likely be an early focus. Ancillary equipment related to salvageable material will also be removed, including possibly transformers.
- Interior Extraction Activities - Once salvageable material is removed, the rest of the materials inside the power building will be removed and transported offsite to be recycled or disposed of. In general, generator areas that have been salvaged would be addressed first, then boilers associated with those areas.
- Power Building Demolition - Once the interior of the main power building is cleared, the building itself will be systematically disassembled and the materials organized for recycling or disposal. Cooling water inlet and discharge tunnels for this location will be back filled. Finally, asphalt/concrete from the power building area and associated parking locations that will not be used for the new units will be removed.
- Stack Removal - This task could commence at anytime after the sampling and testing activities referred to above are completed. Stack removal is expected to take about 6 to 9 months and is not expected to be accomplished with dynamite, as this is unnecessary and will generate dust. Instead, each stack is expected to be taken down in pieces, sliced off the top, one stack at a time. The activity itself is not expected to generate much noise and dust will be minimized by avoiding use of explosives. But, given the history of the stacks, the removal process is actually expected to be of interest to tourists and local residents.

- Back filling of Power Building Basement Area/Site Re-grading - Once the stacks and power building are taken down, stock piled concrete rubble will be used to back fill the basement area. Additional fill material will be brought onsite only as necessary to complete the compaction and grading. After the entire area has been graded, new topsoil will be added as appropriate, and landscaping will be performed.
- Removal of the Metal Cleaning Waste Ponds - the existing ponds will be closed and removed in accordance with regulatory requirements. It is anticipated that the ponds will be used during rinsing and draining activities in preparing the boiler and auxiliary systems for demolition. These activities are washing of air preheaters, boiler rinse and drain, stack washing, etc. Once these activities have been completed, the ponds will be cleaned and permits will be obtained for their removal. Once the ponds have been removed, a survey of soil and groundwater beneath the ponds will be conducted to determine what level of remediation or monitoring, if any, will be required. When the jurisdictional regulatory agencies approve the clean up levels, the area will be back filled, compacted and graded for a drainage pattern compatible with the rest of the site.

Overall, as shown in Figure 2-11, power building shutdown, stack removal and equipment disassembly is expected to take 4 years. In the first year, most work will be inside the power building (except for stack removal) and will hardly be noticeably offsite. As the power building itself is disassembled, the work will begin to be noticed from offsite locations. As noted, stack removal is expected to generate interest in the community when it is performed

As shown in Figure 2-10, manpower levels for these activities will be very low, and delivery traffic, while steady, will not reach the level encountered during construction of the new units.

2.4 SITE AND FACILITY SELECTION CONSIDERATIONS

Duke Energy selected MBPP for the Project after careful consideration of the following:

- **Existing Facilities**. With minor modifications, the existing transmission, gas, and water facilities can accommodate small, incremental additional capacity proposed by the Project. New pipelines and electrical transmission lines will not be required, except for short segments within MBPP to connect the Project to existing fuel supply and electrical transmission facilities. New intake and discharge structures for cooling water are not required. Locating the combined cycle units on the existing MBPP site will reduce environmental impacts and the cost of power generation compared to creating a new power plant site. Furthermore, a review of alternative industrial sites in San Luis Obispo County indicates that no site exists with comparable existing infrastructure.
- **Power Generation Is Consistent With Local Plans**. The MBPP has operated since the mid-1950s and is an integral part of land use plans for the City of Morro Bay and San Luis Obispo County. Locating the combined cycle units onsite, as compared to an offsite location, is

consistent with the Morro Bay Coastal Land Use Plan, Policies for Energy-Related Development (Policies 5.01 and 5.20), the Morro Bay General Plan (Program LU-40.15) and the San Luis Obispo General Plan, Energy Element and Land Use Element. Modernization, for which the Project is an integral part, is consistent with the existing, long-term use of the Property for electrical generation.

- **Environmental Impacts Are Minimized**. The Project will not disrupt undisturbed areas for construction of the power plant site transmission lines, gas pipelines, or water connections. Given the existing setting, minimal impacts are expected from noise, land use, agriculture and soils, geologic resources and hazards, hazardous materials, waste management, worker safety, public health, cultural resources and paleontological resources. Design features will reduce impacts related to visibility, air quality, water and biological resources, and noise.
- **Visual Setting**. Duke Energy has paid particular attention to the visual setting in selecting the site. A thorough evaluation determined that the tank farm provides an optimal location for the combined cycle units as it allows screening of the Project by an enlarged earthen berm. Furthermore, placing the combined cycle units in the fuel oil tank area with the combined cycle unit stacks clustered to the center of the footprint best screens the Project from near beach views, the Embarcadero, and reduces the apparent height of the stacks and power generating equipment from the hillsides. The use of a removable low profile building also reduces the height and mass of the combined cycle units and improves views of Morro Rock. In addition, new landscaping will blend with existing vegetation to further screen the Project from offsite areas. Furthermore, because of the desire of the community to remove the existing power plant, Duke Energy will remove the three existing 450-foot-tall stacks and large boiler and turbine building for Units 1 through 4 to improve the visual character of the Property.
- **Benefit to the Public**. The Project also improves the operation of PG&E's transmission system. It provides power with minimal environmental impacts, reduces existing sound levels from MBPP, and provides additional coastal access. The Project supports the City of Morro Bay and San Luis Obispo County through property, sales and payroll taxes. It minimizes the use of fresh water, decreases air emissions in California, and reduces the overall cost of electricity. Finally, as discussed above, the Project improves the visual character of MBPP.

Based on these considerations, Duke Energy proposes the Project at MBPP. Further discussion of site selection and alternative power generating technologies and other systems is included in Chapter 5.0 - Alternatives Analysis. Detailed evaluations of existing environmental conditions and potential environmental impacts are provided in Chapter 6.0 of this AFC.